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ERRATA.

Page 167, line 3, *for* F.Z.S. *read* C.M.Z.S.
Page 307, col. 1, line 15, for *aquila* read *aguia*.
Page 451, line 15, for *Margaronis* read *Margarornis*.
Page 451, line 19, for *Megarornis* read *Margarornis*.
Page 530, line 13 from bottom, for *tachardus* read *desertorum*
Page 531, line 3, *for* 'Illustrated London News' *read* 'Field.'
Page 533, line 2, *for* J. M. Cornely *read* J. M. Cornély.
Page 533, line 14 from bottom, *for* Mr. B. Tegetmeier *read* Mr. W. B. Tegetmeier.
Page 533, line 8 from bottom, *for* C.M.Z.S. *read* F.Z.S.
Page 557, line 19, *for* BERGII *read* BERGII.
Page 617, line 12 from bottom, *for* OBINUSALIS *read* OBRINUSALIS.
Page 631, line 8, for *Eumelea* read *Eumelia*.

PROCEEDINGS

OF THE

SCIENTIFIC MEETINGS

OF THE

ZOOLOGICAL SOCIETY OF LONDON.

January 2, 1877.

Prof. Newton, F.R.S., V.P., in the Chair.

The following report on the additions to the Society's Menagerie during the month of December 1876 was read by the Secretary:—

The total number of registered additions to the Society's Menagerie during the month of December 1876 was 68, of which 36 were obtained by presentation, 10 by purchase, 1 by exchange, and 21 were received on deposit. The total number of departures during the same period by death and removals was 85.

The most noticeable additions during the month were:—

1. A Snowy Owl (*Nyctea nivea*) captured in the west of Ireland, and presented to the Society by Mr. John Kendall, December 4th.

I take this opportunity of calling the attention of the Society to the abundance of specimens of the Snowy Owl during the present winter. One of the dealers in Liverpool writes that he has received at least thirty specimens from vessels crossing the Atlantic to that port. Besides the present bird two other recently acquired examples are living in the Society's collection. Letters from America also speak of the unusual abundance of this bird in the Northern States, and in the adjoining districts of Canada.

2. Three Mexican Jays (*Cyanocorax luxuosus*), purchased December 9th, being the first specimens of this handsome bird that have reached us alive.

3. Two Orange-headed Ground-Thrushes (*Geocichla citrina*), two White-throated Laughing Thrushes (*Garrulax albogularis*), and one Horsfield's Whistling Thrush (*Myiophoneus horsfieldi*), from India, being likewise all representatives of species new to the Society's collection.

4. Two Black-headed Partridges (*Caccabis melanocephala*) and one Hey's Partridge (*Caccabis heyi*) from Hedyar near Mecca. Presented by Commander F. M. Burke, December 30th.

The birds of Arabia are so little known to us that we are always glad to receive specimens from that coast. Of the large black-headed *Caccabis* (see P. Z. S. 1837, p. 818) we have only once before received a living specimen.

Professor Newton exhibited a variety of the Guillemot (*Alca troile*) remarking:—"The specimen on the table has been kindly lent me by Mr. T. M. Pike, of Wareham, who shot it on the 29th of November last, at sea, between Poole and Christchurch. It is the first example I have seen of the curious variety briefly described by Dr. Krüper ('Naumannia,' 1857, p. 437), on the authority of Pastor Jon Jonsson, who saw one which had been taken, in July 1848, at Grimsey, off the north coast of Iceland, and seems to agree in all respects with the bird so described. It differs strikingly from the normal appearance of the species in the colour of the bill and legs, which, as will be seen, are of a bright yellow, while the claws are white. This last fact points, I think, to the variation originating from the cause which produces albinism in so many animals. Further than this I will only call your attention to a somewhat similar variety of *Pica rustica*, seen, though not obtained, by Mr. Harvie Brown in Scotland some years since (Zool. 1867, pp. 706, 757, 826, 877, 913), and again in Devonshire by Mr. G. F. Mathew (*tom. cit.* p. 1016), in which the bill was yellow—as well as to the yellow colouring of the bill occasionally found in examples of the variety of the Northern Diver which has been described under the name of *Colymbus adamsi*.

The following papers were read:—

1. Notes on the Visceral Anatomy and Osteology of the Ruminants, with a Suggestion regarding a Method of expressing the Relations of Species by means of Formulæ. By A. H. Garrod, M.A., Prosector to the Society.

[Received January 2, 1877.]

There is so little known of the differences in the visceral anatomy of the many genera and species of the ruminating animals, that I feel that no apology is necessary for bringing before this Society the facts which my prosectorial opportunities afford me with reference to parts which are either too large or too perishable to be easily preserved in our museums. The following "Notes" will be found to

contain an account of those parts in certain species of the Cavicornia and Cervidæ (such as the stomach, liver, generative organs, and brain), which are subject to variation in the different species that I have had the opportunity of examining.

The *stomach* of the Ruminantia, on account of its complexity, presents features of special interest. As far as the general shape and proportions of its cavities are concerned, my observations tend to show that the relative size of the psalterium in the different genera is the only characterizing feature. In the abomasum I have not detected any variation.

The rumen varies as to the shape and distribution of the villi on its mucous membrane. In most of the smaller species the folds which constrict the viscus, as well as the pouches between them, are covered internally with villi, though these are larger in the latter situations. In most of the larger species the villi are absent on the folds, and are largest in the middle of the pouches. This is specially the case in the Rusine Deer. In the Sheep and its allies they are peculiarly scattered and broad at their bases, as is also the case in *Moschus*. In most of the smaller species of the order they are cylindrical or flattened cylinders, as close-set as the "pile" in velvet. In *Portax picta* they are very elaborate, close-set, pedunculated and foliaceous. In *Cervus alfredi* they are flattened and expanded apically, in other words tongue-shaped, as they are in *Camelopardalis giraffa*. In *Tetraceros subquadricornutus* all the villi are flattened, broad, and rounded, absent on the folds. In Table I. column VIII., further notes on the peculiarities in the rumen will be found.

The reticulum varies in the depth and size of its cells, but not to any great extent. I have not ever seen them deeper than in *Cervus duvaucelli* ($\frac{1}{6}$ inch), or shallower than in the Giraffe. In some species the cell-walls are thicker than in others, as may be seen on reference to Table I. column IX.

The psalterium varies more than any other section of the stomach; and a study of its laminæ brings to mind the septa of some of the more elaborate and fully calcified corals; for, as in them, the laminæ are of different lengths, and their arrangement is subject to definite laws.

This organ may be defined as a subglobose dilatation of the upper wall of the canal leading from the reticulum to the abomasum, the lumen of which is much reduced by the development from all but its lower wall of longitudinal villous-covered folds of its mucous lining. In size it differs greatly, being very large in the genus *Bos*, minute in *Nannotragus* and *Cephalophus*.

Of the laminæ there are a certain number (frequently ten) of a definitely greater depth than any of their neighbours; and these may be termed *primary* laminæ. Between each two of these there are *secondary* laminæ of smaller size; and such being the case, nineteen is the average number of the two sets combined. When the organ is more complex a still shallower *tertiary* lamina appears on each side of each secondary one; and there may be *quaternary* laminæ on each side of each tertiary, on either side, again, of which there may

TABLE I.

I. Name.	II. Gall-bladder.	III. Caudate Lobe.	IV. Spigelian Lobe.	V. Depth of Umbilical Fissure.
Cervus elaphus	Absent.	Lateral in young, small in adult.	Absent.	Almost nil.
—— *cashmeerianus*	Absent.	.....	.....	.....
—— *dama*	Absent.	Almost nil.	Absent.	$\frac{1}{4}$
—— *aristotelis*	Absent.	Square.	Oviform in one, rusiform in another.	$\frac{1}{4}$
—— *swinhoii*	Absent	Large, square.	Rusiform.	$\frac{1}{4}$
—— *kuhlii*	Absent.	Square.	Absent.	.....
—— *moluccensis*	Absent.	Squarish.	Oviform.	$\frac{1}{4}$
—— *mariannus*	Absent.	Square.	Absent.	$\frac{1}{4}$
—— *duvaucelli*	Absent.	Square.	Rusiform.	$\frac{1}{8}$
—— *porcinus*	Absent.	Lateral.	An oviform rudiment.	$\frac{1}{2}$
—— *alfredi*	Absent.	Large, square.	Oviform, small (juv.).	$\frac{1}{4}$
—— *capreolus*	Absent.	Lateral.	Oviform and everted.	$\frac{1}{4}$
Cervulus muntjac	Absent.	Lateral.	Rudimentary.	$\frac{1}{2}$
—— *reevesi*	Absent.	.....	.....	.....
Elaphodus cephalophus	Absent.	Small, lateral.	Oviform rudiment.	$\frac{1}{2}$
Cervus pudu	Absent.	Lateral.	Absent.	
—— *campestris*	Absent.	Lateral.	Absent or rudimentary.	Nil.
—— *rufus*	Absent.	Squarish.	Absent.	$\frac{1}{4}$
—— *mexicanus*	Absent.	Lateral.	Absent, or rudimentary.	$\frac{1}{2}$
Camelopardalis giraffa	Absent.	Absent.	Absent.	$\frac{1}{4}$
Moschus moschiferus	In fossa.	Small, lateral.	Large, rusiform.	$\frac{1}{4}$
Antilocapra americana	In fossa.	Very small, lateral.	Rusiform.	$\frac{1}{4}$
Ovis cycloceros	Very elongate.	Lateral.	Oviform.	$\frac{1}{4}$
Capra picta	Very elongate.	Short, lateral.	Oviform.	$\frac{1}{4}$
—— *jemlaica*	Very elongate.	Short, lateral.	Oviform.	
Gazella dorcas	In fossa.	Small, lateral.	Absent.	$\frac{1}{8}$
—— *granti*	In fossa.	Small, lateral.	Small, rusiform.	$\frac{1}{8}$
—— *subgutturosa*	In fossa.	Small, lateral.	Oviform, or absent.	$\frac{1}{8}$
—— *muscatensis*	In fossa.	Small, lateral.	Absent.	$\frac{1}{8}$
—— *rufifrons*	In fossa.	Small, lateral.	Rudimentary.	$\frac{1}{4}$
—— *arabica*	In fossa.	Small, lateral.	Oviform.	$\frac{1}{4}$
Nanotragus nigricaudatus	Present.	Rudimentary.	Modified, rusiform.	$\frac{1}{8}$
Cephalophus maxwelli	Absent.	Short.	Modified, rusiform.	$\frac{1}{8}$
—— *pygmæus*	Absent.	Short.	Modified, or absent.	$\frac{1}{8}$
Tetraceros subquadricornutus	Present, as is cystic fissure.	Absent.	Absent.	$\frac{1}{8}$
Strepsiceros kudu	Elongate.	Lateral.	Rudimentary.	$\frac{1}{8}$
Oreas canna	Present.	.....	Oviform.	.....
Tragelaphus scriptus	Elongate.	Lateral.	Absent.	$\frac{1}{3}$
Damalis pygarga	Present.	Small, lateral.	Enormous, rusiform.	$\frac{1}{2}$
Catoblepas gnu	Elongate.	.....	.....	.....
Addax naso-maculatus	Very elongate.	Very short.	Oviform.	Rudimentary.
Portax picta	Present.	Short.	Absent.	$\frac{1}{8}$

Table I.

VI. Length of Cæcum and Sex of specimen.	VII. Intestinal lengths.	VIII. Papillæ of Rumen.	IX. Cells of Reticulum.	X. Psalterium.
1¼ ft. ♀, adult.	S.I. 42 ft. L.I. 30¼ ft.	Cylindroid, elongate, flattened.	Not deep.	Quadruplicate, 13.
..... ♂, adult.	.....	..... Cylindrical, except longest (1 in.), flattened and expanded.	..... Shallow.	Quadruplicate, 10. Triplicate.
♂, nearly adult.	.....	Cylindroid.	Broad-walled.	Quadruplicate, 10.
1½ ft. ♂, adult.	S.I. 48½ ft. L.I. 25½ ft.	Cylindroid, slightly flattened.	Broad-walled.	Quinquiplicate, 12.
5 in. ♂, adult.	S.I. 29½ ft. L.I. 10 ft.	Cylindroid, slightly flattened.	.....	Quadruplicate, 9.
1½ in. ♂, new-born.	S.I. 14½ ft. L.I. 3½ ft.	.....	.....	Quadruplicate, 10.
10 in. ♀, adult.	S.I. 39½ ft. L.I. 15 ft.			
1 ft. ♀, aged.	S.I. 45 ft. L.I. 25½ ft.	Cylindroid and tongue-shaped.	Deep, ⅜ inch.	Quadruplicate.
7 in. ♂, a year old.	S.I. 25½ ft. L.I. 13½ ft.	Slender, small, cylindroid.	Broad-walled.	Quadruplicate.
10 in. ♂, adult.	S.I. 34 ft. L.I. 18 ft.	Some large and tongue-shaped.	Fairly deep.	Quadruplicate, 10.
10 in. ♂, adult.	S.I. 31⅜ ft. L.I. 15½ ft.	Cylindrical.	Very shallow.	Quadruplicate.
7 in. ♂, adult.	S.I. 18½ ft. L.I. 8½ ft.	Cylindrical.	.....	*Triplicate*, 10.
9¼ in. ♂, not adult.	S.I. 23¼ ft. L.I. 9½ ft.			
6 in. ♂.	S.I. 24⅜ ft. L.I. 9½ ft.	Cylindrical and slightly flattened.	Very shallow.	*Triplicate*, 10.
11 in. ♀, adult.	S.I. 28⅝ ft. L.I. 16½ ft.	Cylindrical.	.....	*Quadruplicate*, 9.
5½ in. ♂.	S.I. 29⅜ ft. L.I. 9½ ft.	Short, flattened.	Very shallow.	*Quadruplicate*, 11.
2 7/12 ft. ♀, adult.	S.I. 136 ft. L.I. 75 ft.	.....	.....	*Quadruplicate*, 18.
.....	.....	.....	.....	*Duplicate*, 19.
1½ ft. ♀, adult.				
.....	.....	.....	.....	*Quinquiplicate*, 9.
1¼ ft. ♂, adult.	S.I. 45½ ft. L.I. 19 ft.			
1½ ft. ♂, adult.	S.I. 45½ ft. L.I. 19 ft.			
8½ in. ♀.	S.I. 42½ ft. L.I. 15½ ft.			
8½ in. ♂.	S.I. 36⅜ in. L.I. 11½ ft.	Small, slightly flattened.	Shallow.	*Triplicate*, 10.
5½ in. ♂.	S.I. 19 ft. L.I. 9 7/12 ft.			
♂, juv.	.....	Uniformly short and a little flattened.	Fair depth.	*Triplicate.*
7 in. ♂.	S.I. 16¾ ft. L.I. 11 ft.	Mostly cylindrical, some tongue-shaped.	Fair depth.	*Duplicate*, 9.
8 in. ♂.	S.I. 21⅜ ft. L.I. 9⅛ ft.	Cylindrical and short.	.....	*Duplicate*, 10.
6 in. ♂, adult.	S.I. 20⅝ ft. L.I. 9½ ft.	Cylindrical and short.	Fair depth.	*Triplicate*, 10.
6 in. ♀.	S.I. 20¼ ft. L.I. 9⅛ ft.	All flattened.	Shallow.	Triplicate, 10.
2¼ ft. ♂, adult.	S.I. 108 ft. L.I. 78 ft.			
8 in. ♂, adult.	S.I. 20½ ft. L.I. 16 ft.	All flattened and tongue-shaped.	.....	*Quadruplicate*, 9.
10 in. ♀. 1¼ ft.	S.I. 42⅜ ft. L.I. 17 1/12 ft. Total length of intestines 118¼ ft.	Sparse, flattened.	Fair depth.	*Quadruplicate*, 15.
1 ft. 5 in. ♂, aged.	S.I. 53⅜ ft. L.I. 29½ ft.	Mostly elongated, cylindrical, some foliaceous.	Shallow.	*Quadruplicate*, 15.
1⅔ ft. ♀, adult.	S.I. 82½ ft. L.I. 42 ft.	Large and foliated.	Well developed.	*Quinquiplicate*, 10.

be a row of papillæ indicating the rudiments of laminæ of a fifth power; for, when disappearing, laminæ always end as rows of papillæ.

In the case of a transverse section of a quadruplicate psalterium (in other words, of one in which there are laminæ of four powers), the quaternary folds being rudimentary, imagine it to be cut through longitudinally along the middle of its groove, and opened out in such a way that the outer wall forms a straight line, whilst the laminæ depend from it; then the appearance will be that of fig. 1.

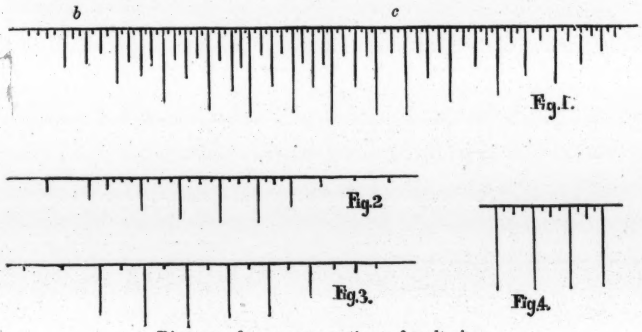


Diagram of transverse sections of psalterium.

This being from an actual specimen, there is a slight want of uniformity at *b* and *c*, which is usually found to be the case. The laminæ of each cycle, or power, gradually diminish in size laterally; and it will be noticed that, though the organ is quadruplicate where the folds are relatively largest, the smallest laminæ disappear at the sides. This is nearly always the case, as it is also that near the orifice of communication with the reticulum they are stronger than they are further on.

In different genera the relative depths of the laminæ which constitute the separate cycles is not always the same. The arrangement depicted above is the most usual, in which the secondary folds are about two thirds the size of the primary, a similar difference existing between them and the tertiary, and so on.

Fig. 4 is from the psalterium of *Gazella arabica*, in which, though the disposition is triplicate, it is seen that the secondary laminæ are very little larger than the papillary rows which form the tertiary cycle, the primary laminæ being of considerable depth. The structure in *Cephalophus* is the same, only that, the psalterium being much smaller, all the parts are much reduced in size, the lateral laminæ especially so. In *Nannotragus nigricaudatus* the equally small psalterium is even more simple, there being but six primary laminæ of any depth; and these are covered with peculiarly large and pointed papillæ, three more being evidently their lateral homologues, although reduced to papillary rows. The conditions are represented in figs. 2 (*Cephalophus*) and 3 (*Nannotragus*).

The psalterium of *Moschus moschiferus* differs essentially from any other with which I am acquainted. Prof. Flower has fully described and figured it[1], at the same time that he has pointed out how much the specimen in the Museum of the College of Surgeons differs from that the account of which is given by Pallas[2]. Mr. Flower has kindly permitted me to examine the specimen. The nineteen plicæ all belong to the primary cycle without doubt; and as this number is that of the primary together with the secondary folds in most ruminants of the same size, it appears to me that their peculiarity consists in the exaggerated development (to the size of the primary) of the second cycle. These laminæ are also peculiarly close to one another at their lines of attachment, which is further in favour of this view. Between some of the folds I have detected lines of papillæ; but their presence is the exception, not the rule.

Where the psalterium is large it is sometimes found that longitudinal rows of papillary lines are present at intervals on the primary folds, and even the secondary laminæ. These are very conspicuous in *Portax picta*.

In some quadruplicate and in all quinquiplicate psalteria the cycles of smallest laminæ are nothing more than rows of papillæ. In other quadruplicate psalteria the cycles of the fourth power are developed as true folds without any ultimate lines of papillæ. Whether or not this is the case is indicated in Table I. (p. 5) by the descriptive name in column X., whatever the power, being printed in roman letters or italics. When in italics the laminæ of the highest power are only represented by papillary rows.

The *liver* is always simple and small, being situated almost entirely on the right side of the median line. The umbilical fissure never extends more than one half through the organ, generally less. The lateral fissures never exist.

The gall-bladder is absent in all the Cervidæ, according to my observations, and in the genus *Cephalophus* among the Bovidæ.

The caudate lobe is very variable in size, and is frequently smaller in adult than in young individuals. In most species it is elongate, slender, and lateral, forming little more than an incomplete cap to the right kidney; in some it is quadrate from the development ventrally of its basal portion.

The Spigelian lobe is frequently entirely absent, as such. When present it is a development of the median portion of the posterior margin of the portal fissure, extending so as to overlap it. When its base is broad, as in the Sheep, it may be termed *oviform*; when it is pedunculate, as is generally the case in the genus *Rusa*, it may be termed *rusiform*.

Variations of slight degree are found in individuals of the same species. From Table I. (pp. 5, 6) the peculiarities of the different varying parts of the organ in the specimens which I have had the opportunity of examining may be determined (columns II. to V.).

[1] P. Z. S. 1875, p. 170.

[2] Spicilegia Zoologica, fasc. xiii. (1779).

Livers of various Ruminants.

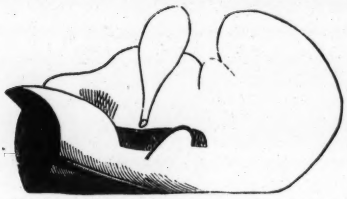


Fig. 5. *Ovis aries.*

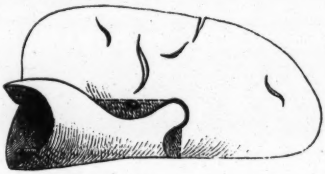


Fig. 6. *Cephalophus maxwelli.*

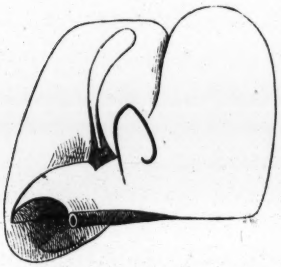


Fig. 7. *Damalis pygarga.*

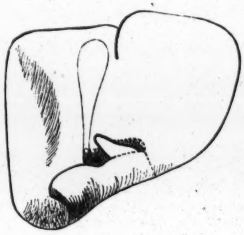


Fig. 8. *Nannotragus nigricaudatus.*

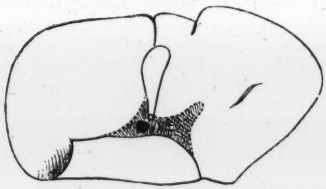


Fig. 9. *Tetraceros subquadricornutus.*

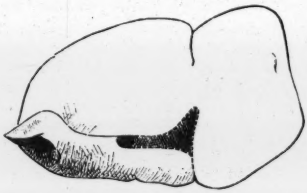


Fig. 10. *Cervus mexicanus.*

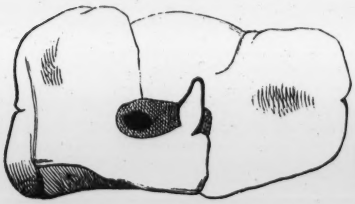


Fig. 11. *Cervus swinhoii.*



Fig. 12. *Cervus duvaucelli.*

The *generative organs* of the Ruminantia present many features of interest bearing on classification. These are mainly to be found in the shape of the glans penis, the development of Cowper's glands, and the number of cotyledons in the placenta.

The glans penis is very different in shape in the various genera of the Ovidæ as well as of the Cervidæ. In all it is the case that the terminal portion of the urethra is extremely small in calibre. Figs. 13–15 give views of the lateral, anterior, and inferior surfaces

Fig. 13.



Fig. 14.

Fig. 15.

Penis of *Cervus cashmeerianus*.

of the organ in *Cervus cashmeerianus*, with which the following species agree in structure—*C. elaphus*, *C. dama*, *C. aristotelis*, *C. moluccensis*, *C. kuhlii*, *C. alfredi*, and *C. porcinus*. In them the glans constitutes a cylinder, slightly flattened from side to side, about one fourth as deep as it is long, measured from the preputial reflection. Its extremity is obtuse, vertically grooved, and slightly flattened, the orifice of the urethra appearing on the apex of a simple blunt cone about one sixth of an inch in height, the base of which is slightly included in the lower termination of the apical vertical fold, near its lower or frenal margin.

In *Cervus mexicanus*, *C. pudu*, and *C. campestris* the arrangement is somewhat different, the vertical groove being absent, the termination of the glans being a blunt cone, with the urethral orifice at its apex, as is seen in fig. 16 (p. 10).

In *Capreolus caprea*, *Cervulus muntjac*, and *Elaphodus cephalophus* the glans is peculiarly long and slender, at the same time that it is nearly cylindrical, with a rounded apex, at the lower part of which the urethra opens by a simple orifice. This is seen in fig. 17 (p. 10) taken from the Roebuck. In *Tragelaphus scriptus* it is the same.

In *Bos taurus* the glans is elongated, forming an irregular cylinder, smoothly rounded at the apex, the urethra (which has no free terminal extension) opening below it at a little distance from the extremity in a downward direction. This is seen in fig. 19 (p. 10).

In the Sheep the apex is somewhat enlarged, but not uniformly so, the expansion forming a partial twist from below and behind, upwards and forwards to the tip, along the left side of the organ. The actual point at which the attached part of the urethra ter-



Fig. 16. *Cervus mexicanus.*



Fig. 17. *Capreolus capræa.*



Fig. 18. *Addax naso-maculatus.*



Fig. 19. *Bos taurus.*

minates is nearly the same as in the Ox, from which, besides the turn it takes, it differs in that it continues on free, as a filiform tube, for an inch at least.

The glans in *Capra* (*picta* and *jemlaica*) and *Gazella* (*arabica*, *subgutturosa*, *rufifrons*) is the same; as is that of *Cephalophus* (fig. 20)

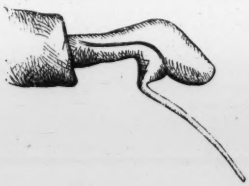


Fig. 20. *Cephalophus maxwelli.*

(*maxwelli* and *pygmæus*), except that it is more symmetrical. In *Addax naso-maculatus* an almost identical condition obtains; the glans, however, is nearly regular in shape and cylindroid, whilst the

free filiform urethra, an inch in length, turns upwards round it to the left (fig. 18).

In the other Cavicornia the glans penis is different. In *Nannotragus* (*nigricaudatus*) it does not in the least resemble that of *Cephalophus*; for it forms a slender, elongated, tapering cone, beyond which the urethra, which is free from it for the terminal $\frac{1}{8}$ of an inch, continues straight on for $\frac{1}{8}$ of an inch (fig. 21). *Tragelaphus*



Fig. 21. *Nannotragus nigricaudatus.*

(*scriptus*) differs but little from this, except that the free portion of the urethra is wanting, and the end of it slightly turned upwards; and in *Damalis* (*pygarga*) (fig. 22) the arrangement resembles that of *Tra-*



Fig. 22. *Damalis pygarga.*

gelaphus, except that the whole glans is shorter and thicker, at the same time that it is flattened from side to side. According to Dr. Murie's accounts of the Prongbuck[1] (*Antilocapra americana*) and the Saiga[2] (*Saiga tartarica*) the glans in these two animals differs from that in any of those above described, whilst from Pallas's account of the Musk (*Moschus moschiferus*)[3] its penis is apparently ovine, as is that of the Giraffe (*Camelopardulis giraffa*) (fig. 23).



Fig. 23. *Camelolepardalis giraffa.*

Cowper's glands are present, according to my observation, in *Cervulus muntjac* and *Cervus mexicanus*; and I have noted that they are small in *C. alfredi*. Their absence I have recorded in *C. elaphus*, *C. dama*, *C. cashmeerianus*, *C. aristotelis*, *C. moluccensis*, *C. porcinus*, *C. kuhlii*, and *C. campestris*. Prof. Flower found them in *C. pudu*. I have seen them also in all species of *Ovis*, *Capra*, and *Gazella* examined, as well as in *Cephalophus* (*maxwelli* and *pyg-*

[1] P. Z. S. 1870, p. 352.

[2] P. Z. S. 1870, p. 485.

mæus), *Nannotragus* (*nigricaudatus*), *Tragelaphus* (*scriptus*), *Damalis* (*albifrons*), and *Addax* (*naso-maculatus*). According to Dr. Murie they exist in the Prongbuck and Saiga; in *Moschus* according to Pallas, and in the Giraffe according to Prof. Owen[1].

In the uterus of the Cotyledontophora it is well known that there are papilliform developments of the inner walls which serve for the attachment of the cotyledons in the impregnated organ. Although it has not been actually proved, so far as I am aware, by direct evidence that the cotyledonary papillæ and the cotyledons are exactly the same in number in each individual, yet there is every reason to believe that it is so. On this assumption I take the number of these papillæ as an index of the nature of the placenta itself, this being so difficult to obtain on account of the universal habit among the females to eat it immediately it is expelled, parturition generally occurring at night-time.

The following Table contains a statement of the number of papillæ or cotyledons (as the case may have been) which I have found, together with those made by Prof. Turner on the same subject[2]. From it I feel justified in deducing the law that the cotyledons are few in the Cervidæ, numerous in the Bovidæ—at the same time that I would suggest the name OLIGOCOTYLEDONTOPHORA for the former, and POLYCOTYLEDONTOPHORA for the latter.

TABLE II.

Name.	Authority.	Number of Cotyledons.	Number of Papillæ.
Cervus elaphus	Turner & A. H. G.	12 or 8.	
—— *duvaucelli*.....	A. H. G.	.....	4 in each cornu.
—— *campestris*.....	,,	9, 8 large and 1 small.	
—— *rufus*	,,	.....	5 in one cornu, 4 in the other.
Hydropotes inermis	,,	2 fœtus, with 3 cotyledons in one cornu and 5 in the other.	
Capreolus caprea	Bischoff.	5 or 6.	
Ovis aries	Turner.	60 to 100.	
Bos taurus.....	,,	60 to 100.	
Damalis pygarga	A. H. G.	.....	Very many.
Camelopardalis giraffa...	Owen.	180 large and small.	
Rupicapra tragus.....	A. H. G.	As in *Ovis*.	4 in one cornu.
Rangifer tarandus	Spec. No. 2755 in R. C. S. Museum, and Catalogue description.	.....	

Osteologically, among the Cervidæ, the skull presents features which correspond in great measure with their geographical distribution; and, dentally, the peculiarities of the third lower premolar are most instructive. The consideration of these latter I hope to be able

[1] Trans. Zool. Soc. vol. ii. p. 240.
[2] Comp. Anat. of Placenta, 1875, p. 66.

to bring before the Society on a future occasion, when my material has become more abundant.

In all Old-World Cervidæ examined by me, with the exception of the Reindeer, the vomer is not so much ossified as to divide the posterior osseous nares into two distinct orifices, whilst in *Rangifer tarandus* and all the New-World Deer, excepting *Alces machlis* and *Cervus canadensis*, it is so. I have seen most of the skulls of Deer which are to be found in the superb osteological collection of the British Museum; and it is upon the study of them that this generalization is based. In the following species the vomer is completely ossified behind, so as to separate off the two posterior nares in the macerated skull:

Cervus pudu.	*Cervus leucotis.*
—— *campestris.*	—— *antisiensis.*
—— *columbianus.*	—— *virginianus.*
—— *leucurus.*	—— *mexicanus.*

Neither in *Alces machlis* nor in *Cervus canadensis* is the vomer so extended posteriorly. The condition described is represented in fig. 24 which is from the skull of *Cervus virginianus*.

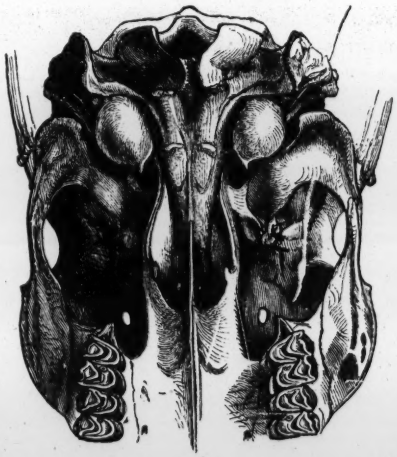


Fig. 24. Base of the skull of *Cervus virginianus*, from below.

In his 'Catalogue of Ruminant Animals in the British Museum,' Dr. Gray lays considerable stress upon the degree of development of the nasal processes of the premaxillary bones, whether or not they meet the nasals. In *Rangifer tarandus* they do not do so, the gap

being filled up by the appearance, superficially, of portions of the nasal turbinal. This is also the case in *Cervus pudu* and *C. columbianus*. In *C. leucurus* the nasal processes of the præmaxillæ are also very short, and they therefore do not join the nasal bones; nor do they in *C. campestris*, nor, generally, in *C. rufus*, and only just in *C. virginianus*. They do join the nasals in *C. leucotis* and *C. antisiensis*. In *Alces machlis*, on account of the extreme shortness of the nasal bones, the premaxillary processes do not meet them; but in all the Old-World Cervidæ the line of junction of the two is considerable, except in *Elaphodus cephalophus* and *Cervulus reevesi*.

In all the American Cervidæ and in the Reindeer the floor of the posterior osseous nares is prolonged backwards more than in their Old-World allies, from the extension backwards of the palatine plates of the palatal bones. In *Cervulus* there is a tendency to this condition, but not in any other Old-World genus.

In his invaluable paper[1] "On the Evidences of Affinity afforded by the Skull in the Ungulate Mammalia," Mr. H. N. Turner remarks:—"I have noticed that in the Moschidæ [*Hyomoschus*, *Tragulus*, and *Moschus*] the styloid process [tympano-hyal] becomes free almost immediately at the base of the auditory process, while in the Bovidæ, or Cavicorn Ruminants, it is enclosed, more or less completely, for some distance in the downward and forward direction." And in all the Cavicornia which I have examined, the tympano-hyal bone is situated on the outer side of the petrosal; whilst in many of the Cervidæ it is posterior, between the petrosal of the temporal and the paramastoid of the occipital bone. In *Cervus porcinus* and *Axis maculata*, however, the expanded auditory bulla insinuates itself from the inner side, between the tympano-hyal and the paroccipital process, as in the Cavicornia. Neither in any of the American Cervidæ, except *C. leucotis*, nor in *Rangifer tarandus*, *Alces machlis*, *Capreolus caprea*, *Cervus dama*, nor in the genera *Cervulus* and *Elaphodus*, does it do so.

In the other Deer (Elaphine, Rusine, and their allies), including *Elaphurus davidianus* and *C. leucotis*, there is a small process of the petrosal, incomparably less than in the Cavicornia, which, from the inner side, partially or just removes the tympano-hyal from the paroccipital (as seen without damage to the skull). This is well marked in *Hydropotes inermis*; and *Moschus moschiferus* is peculiar, in that from the outer side a process is sent inwards to join the other, and so completely to encircle the tympano-hyal with a ring of bone in a very suspiciously Cavicorn manner. The Giraffe, in this respect, much resembles *Moschus*.

It is worthy of note that in *Cervus antisiensis* the median incisors are not triangular, in which respect it agrees with *Rangifer* and *Moschus* and differs from the Cervidæ generally. In *C. leucotis* they are so. In *C. pudu*, as in *Moschus*, the Giraffe, and many Cavicornia, there is only one submental foramen on each side—not two, as in by far the majority of the Deer.

The peculiar way in which, on each side, the palatal surface of

[1] P. Z. S. 1849, p. 152.

the interval between the canine tooth and the first premolar is cut away in all the true Ruminantia, and not in the Tragulidæ, is interesting as a separating feature. In the Cervidæ there is a difference from the Cavicornia in the arrangement of the region just in front of this. In the Sheep and its allies the median palatal process of each premaxillary bone extends back in the palatal region between the maxillæ for some distance behind the most anterior portion of the facial surface of the maxillary bone, broadening as they go backwards for some distance, and then narrowing to a point somewhat abruptly. In no Deer which carries antlers have I found this arrangement, the median palatal processes of the præmaxillæ in them being always slender (sometimes only incompletely developed), of uniform breadth, and terminating posteriorly at a point scarcely behind the line which joins the canine teeth. Both *Moschus moschiferus* and *Hydropotes inermis* agree with *Ovis* in this respect, as does the Giraffe.

Again, in the squamosal of the temporal there is a feature of value in the separation of the two major divisions of the typical Ruminantia. In the Cervidæ this bone is deeper from above downwards than in the Bovidæ; in other words, the parieto-squamosal suture is situated nearer the upper border of the temporal fossa (more than halfway up it) in the former group, the general proportions produced by which are more easily recognized by inspection than from description. The squamosal of *Moschus* is oviform, that of *Camelopardalis* intermediate.

Whilst comparing the skulls of the Cervidæ which I have examined, the antlers have naturally attracted my attention; and many of their peculiarities seem to me to be subject to definite laws.

What may be called the typical antler is composed of a bifurcate beam, with a brow-antler springing from the front of its basal portion. These three parts may be termed A, B, and C, as in the accompanying diagram (see p. 16). They occur, uncomplicated, in the genus *Rusa*, in *C. porcinus*, *C. axis*, and *C. alfredi* (fig. 25. 1).

On the assumption that most of the complicated many-pointed antlers that occur are the result of the exaggerated development of one or other or both of the extremities B and C, their special features may be explained. For instance, imagine that both B and C bifurcate, remaining of equal size, and we arrive at the condition found in *Cervus schomburgki* (fig. 25. 2). *C. duvaucelli* differs in that B is extra-developed at the expense of C (fig. 25. 3), the latter often being not bifurcate, though sometimes so to a small extent. Following out the ingenious hypothesis of Mr. Blyth[1], *C. eldi* only differs in the still greater development of the anterior of the branches of B (fig. 25. 4). With this last-named form *C. virginianus* and *C. mexicanus* agree, as does *Rangifer tarandus*, as far as its beam-branches are concerned.

In *Cervus dama*, and in the species included in the genus *Pseudaxis* by Dr. Gray (*C. sika*, *taëvanus*, and *mantchuricus*), a different condition maintains, B being reduced greatly and C correspondingly

[1] P. Z. S. 1867, p. 835.

enlarged (fig. 25. 5). In the Elaphine Deer this is carried further, the continuation of the beam C being divided terminally into many points (fig. 25. 6) in *C. elaphus*, *C. canadensis*, *C. maral*, and *C. cashmeerianus*. According to Mr. Blyth, *C. sika* "belongs strictly to the *Elaphine*, and not to the *Axine*, group"[1] of Deer; and the con-

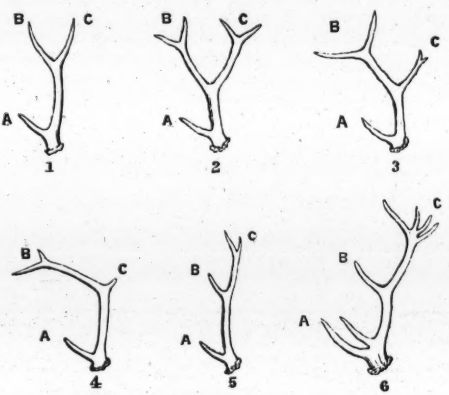


Fig. 25. Diagram of types of antlers.

formation of its horns is decidedly in favour of this view. Nevertheless it must be noted that in its ally, *C. mantchuricus*, and in *C. kopschi* (Swinhoe)—I cannot find a skull of *C. sika* in any museum for comparison—the auditory bulla is considerably inflated, as in *C. porcinus* and *C. axis*. This feature is not, however, of particular importance, as *C. virginianus* in this respect differs from most of the American Cervidæ, possessing a very inflated bulla.

With reference to the brow-antler (A), it is evident that its duplication in the true Elaphine Deer and in *Rangifer* is more associated with the actual size of the antlers than with any other peculiarity.

The antlers of *Elaphurus davidianus* are at present quite beyond my comprehension.

General Remarks.

Whilst working at any special group of animals, there is nothing which must strike most students so much as the inefficient scientific capacities of the Linnæan binomial nomenclature as it is at present employed. For the simple identification of species among themselves and of genera it is excellent, no doubt; but immediately the generic position is assigned to any collection of related species, the animals or plants which constitute them are, so far as nomenclature is concerned, lost in the plurality of mundane organized forms. In the science of chemistry—an older one, it is true—the case is very

[1] J. A. S. B. xxix. p. 90.

different. There, the knowledge of the composition of any non-elementary substance is sufficient for the determination of the name by which it should be designated; and, *vice versâ*, from the name its composition may be inferred. Why should we not be able to do the same in biology? We form estimates as to the mutual affinities of genera which can bear the test of criticism as well as any rational chemical formula; is it not just as possible to express them in our nomenclature as do the chemists in theirs? It is quite conceivable that it should be done; and I have the boldness, on the present occasion, to endeavour to make a step in the direction indicated, taking the Cervidæ to illustrate my method. I should not desire any one to think that the method I am about to suggest is at all a final one; for it only comprehends a single small group of Mammalian animals. Nevertheless, if by it I am able to demonstrate its practical utility, and to develop in others a desire that it should be extended in its scope, there is nothing easier than to expand it.

From what has been remarked earlier in this paper, it is evident that there are osteological reasons for separating off the Old-World from the New-World Cervidæ. Representing degrees of slightly more than generic importance by Roman capitals, this difference between the two groups may be indicated by the employment of letters separated by some distance in the alphabet. I therefore commence with A in formulating the Old-World species, and with P in those of America. Following the initial capital, I place a small letter, which represents the genus; and the species of each of the latter are indicated by numbers following, raised above the line, as in mathematics when the square, cube, &c. are expressed. When a species, like the Elk, stands by itself, it is not necessary to append the smaller signs. With this amount of explanation, the following Table (III.) will need no further description:—

Table III.

Cervidæ.

A. *Alces machlis.*
Ba^{1}. *C. elaphus.*
Ba^{2}. *C. canadensis.*
Ba^{3}. *C. cashmeerianus.*
Ba^{4}. *C. barbarus.*
Ba^{5}. *C. maral.*
Ba^{6}. *C. affinis.*
Bb^{1}. *Dama vulgaris.*
Bb^{2}. *D. mesopotamica.*
Bc^{1}. *Pseudaxis sika.*
Bc^{2}. *P. mantchuricus.*
Bc^{3}. *P. taëvanus.*
Ca^{1}. *Rusa aristotelis.*
Ca^{2}. *R. hippelaphus.*
Ca^{3}. *R. moluccensis.*
Ca^{4}. *R. equina.*
Ca^{5}. *R. swinhoii.*
Ca^{6}. *R. mariana.*
Ca^{7}. *R. peronii.*
Ca^{8}. *R. kuhlii.*
Ca^{9}. *R. alfredi.*
Cb. *C. axis.*
Cc. *C. porcinus.*
Cd^{1}. *Rucervus schomburgkii.*
Cd^{2}. *R. duvaucelli.*
Cd^{3}. *R. eldi.*
D. *Elaphurus davidianus.*
Ea^{1}. *Cervulus muntjac.*
Ea^{2}. *C. reevesi.*
Eb. *Elaphodus cephalophus.*
F. *Capreolus caprea.*
G. *Hydropotes inermis.*

TABLE III. (*continued*).

P. *Rangifer tarandus.*
Qa^1. *Cariacus virginianus.*
Qa^2. *C. mexicanus.*
Qa^3. *C. leucurus.*
Qa^4. *C. macrotis.*
Qa^5. *C. columbianus.*
Ra^1. *Cervus campestris.*
Ra^2. *C. paludosus.*
S. *C. antisiensis.*
T. *C. leucotis.*
Va^1. *C. nemorivagus.*
Va^2. *C. simplicicornis.*
Va^3. *C. rufus.*
Va^4. *C. superciliaris.*
W. *Pudua humilis.*

This synoptical sketch of the affinities of the different species of the Deer tribe expresses much more with reference to the mutual relationships of its component members than could be done by the employment of the binomial nomenclature. For instance, taking the Barasingha Deer, here expressed by Ca^2. In that it is of the C group, its close affinities to the Sambur, Axis, and Hog-Deer is asserted. C being next to B (Elaphine), its not great distance from the Elaphinæ is expressed; whilst, although the Reindeer and the Long-tailed Deer have their antlers developed on very similar types, the distance of their relationship is signified by their alphabetical interval—that between C and P or Q.

Further, in that *Rucervus duvaucelli* is represented by Cd^2, the d proves that there are other genera closely allied to it, namely a, b, and c, at the same time that, as there is a figure appended, it is to be inferred that there is more than a single species in the genus. On the whole, I know no so concise a way of expressing the relationships of species.

As to the affinities of the genera here expressed, some are more certainly based than others. *Capreolus caprea* is one of the most difficult of the Deer tribe to localize; and I have placed it not far from *Cervulus* on account of the configuration of its glans penis. *Dama vulgaris*, as well as *Dama mesopotamica*, from the shape of their antlers—neglecting the palmation, an evidently insignificant character—are intimately allied to the Pseudaxine group; and, as the late Mr. Blyth has so satisfactorily demonstrated, there is no reason why Eld's Deer should be in any genus other than that in which the Barasingha is situated. The abnormal furcation of the antlers of *Elaphurus davidianus* renders it extremely difficult to place that species in any definite position among the Old-World Cervidæ.

2. Descriptions of eight new Species of South-American Birds. By P. L. SCLATER, M.A., Ph.D., F.R.S., and OSBERT SALVIN, M.A., F.R.S.

[Received January 2, 1877.]

(Plate I.)

During our past year's work on the specimens in our Cabinets, we have found it necessary to designate by MS. names the following



J.Smit del.et lith.

M&N Hanhart imp.

CHLÓRONERPES DIGNUS, ♂



species of Birds, of which we now beg leave to submit descriptions to the Society.

1. EUPHONIA FINSCHI, sp. nov.

Violaceo-nigra: pilei dimidio antico et abdomine toto saturate castaneo-aureis: subalaribus et remigum marginibus internis albis: rectricibus omnino nigris immaculatis. Long. tota 3·5, *alæ* 2·1, *caudæ* 1·2.

Hab. Demerara (*Wilkens*).

Mus. P. L. S.

Sclater's collection contains a single skin of this *Euphonia*, which belongs to the group of *E. concinna*. It is most nearly allied to *E. saturata* (Cab.)[1], having a similar chestnut tinge on the abdomen, which, however, is even more strongly developed. But it differs from *E. saturata* in that only the front half of the top of the head up to the eyes is yellow, instead of the whole cap.

The type specimen of this species having been received in exchange from the Bremen Museum, we propose to call it after its worthy Director Dr. Finsch. The collector's name is stated to be Wilkens.

2. PHEUCTICUS CRISSALIS, sp. nov.

Pheucticus aureiventris, Scl. P. Z. S. 1858, p. 551.

Supra niger, uropygio flavo nigro variegato: interscapulii quoque plumis intus flavo transfasciatis: speculo alari et maculis tectricum alarum, secundariorum et caudæ tectricum superiorum albis: subtus aureo-flavus, in pectoris lateribus parce nigro striatus, crisso albo: cauda nigra, hujus rectricibus tribus utrinque externis plaga quadrata alba in pogonio interiore ornatis: subalaribus flavis: long. tota 7·7, *alæ* 4·5, *caudæ* 3·6.

Hab. Ecuador, Riobamba (*Fraser*); Sical (*Buckley*).

Obs. Proximus *P. uropygiali*, sed gutture aureo et crisso albo distinguendus.

In describing *Ph. uropygialis* (P. Z. S. 1870, p. 840) we observed that two skins obtained by Mr. Fraser at Riobamba, in Ecuador, and originally referred to *P. aureiventris* by Sclater, might possibly belong to *P. uropygialis*. It now appears, however, from additional specimens of the same form recently obtained by Mr. Buckley in the same district, that the species of the highlands of Ecuador is quite distinct.

This, therefore, will make a sixth species of *Pheucticus* to be placed between *P. tibialis* and *P. chrysogaster*[2].

3. OCHTHŒCA LEUCOMETOPA, sp. nov.

Ochthœca leucophrys, Scl. & Salv. P. Z. S. 1867, p. 986; 1868, p. 569; 1869, p. 154; & 1874, p. 677; Scl. P. Z. S. 1871, p. 750; 1873, p. 780.

Supra murino-brunnea, dorso postico rufescenti lavato: super-

[1] *Phonasca saturata*, Cab. J. f. O. 1860, p. 336, et *Acroleptes saturatus*, ibid. 1861, p. 91, et 1865, p. 407.

[2] See the list of the species of this genus, P. Z. S. 1870, p. 840.

ciliis longis in fronte conjunctis albis ; alis caudaque fusco-nigris, illarum tectricibus et secundariis externis rufescenti anguste limbatis, hujus rectrice una utrinque extima in pogonio externo alba : subtus pallide cinerea, in ventre crissoque alba : rostro et pedibus nigris: *long. tota* 6·0, *alæ* 3·0. *caudæ* 2·7.

Hab. Western Peru, prov. of Cuzco (*Whitely*); district of Junin (*Jelski*).

Mus. P. L. S. et S.-G.

Obs. Diversa ab *O. leucophryi* (quacum hucusque confusa) dorso minus rufescente et fasciis alarum castaneis omnino absentibus.

The receipt of a skin of the true *O. leucophrys* (Lafr. et D'Orb.) from Bolivia, has enabled us to separate from it this more northern representative of the same form.

4. Ochthœca arenacea, sp. nov.

Supra obscure arenaceo-brunnea unicolor, alis caudaque fuscis, illarum tectricum fasciis duabus terminalibus et secundariorum marginibus externis pallide rufescenti-ochraceis : loris et corpore subtus flavicanti-albis, plaga utrinque pectoris fusca : subalaribus ventre concoloribus : rostro et pedibus obscure corneis : long. tota 5·0, *alæ* 2·7, *caudæ* 2·6.

Hab. Columbia int.

Mus. S.-G.

Obs. Proxima *O. rufo-marginatæ* Lawrencii, ex Æquatoria, sed colore supra pallidiore, fasciis alarum ochraceis, nec castaneis, et rostro latiore distincta.

We have as yet seen but a single "Bogota" skin of this distinct *Ochthœca*, which in general style of colour is much like *O. setophagoides*, but has a much broader bill.

5. Chloronerpes dignus, sp. nov. (Plate I.)

Supra oleagineo-flavus, pileo toto cum nucha necnon dorsi superioris plumarum marginibus ruberrimis : alarum tectricibus ochraceo parce punctatis : subtus flavus, saturato viridi crebre transfasciatus, ventre imo et subcaudalibus immaculatis : subalaribus flavis : remigibus subtus in pogonio interiore obscure viridibus, flavido regulariter notatis : cauda nigra, rectricibus duabus utrinque externis flavis nigro transfasciatis : rostro et pedibus nigris : long. tota 6·5, *alæ* 4·0, *caudæ* 2·2.

Hab. Columbia int. prov. Antioquia (*Salmon*).

Mus. P. L. S.

Mr. Salmon sends us a single specimen of this *Chloronerpes*, which is quite distinct from any thing with which we are acquainted. In its upper surface it is most like *C. malherbi*, and is of about the same size. But it is at once recognizable by the yellow of the lower part of the belly.

The sex of the single specimen is not marked; but, judging by its crimson cap, the bird is probably a male.

6. CELEUS SUBFLAVUS, sp. nov.

Celeus citrinus et *C. exalbidus* ex Bras. merid. or. auctt.

Celeopicus exalbidus (*jeune mâle varié*), Malh. Pic. vol. ii. p. 30, tab. lv. fig. 6.

Cinnamomeo-flavus: alis caudaque fuliginoso-nigris, remigum marginibus internis rufis: dorsi superioris et pectoris plumis fuliginoso-nigris flavo marginatis: rostro flavo, pedibus fuscis: long. tota 9·5, *alæ* 5·2, *caudæ* 3·4: *maris striga mystacali utrinque rubra.*

Hab. Brasil. merid. or. Bahia (*Wucherer*).

Mus. P. L. S.

Obs. A *Celeo flavo* dorso et pectore squamulatis necnon alis extus omnino fuliginoso-nigris distinguendus.

This S.E.-Brazilian form of *Celeus flavus* (sive *citrinus*) is so strongly marked that it seems necessary to distinguish it specifically.

In the typical form from Cayenne and Guiana the whole of the secondary wing-feathers are of a bright chestnut, and the wing-coverts are more or less edged with yellow.

In the Venezuelan and Trinidad form (*Celeus semicinnamomeus*, Reich. Handb. p. 407, et t. DCLXI. fig. 4386) the wing-coverts are immaculate yellow.

In the Upper Amazonian form there is an approach to the Brazilian species in the fuliginous colouring invading the secondaries; but the outer and inner edges of these feathers remain chestnut, though not so bright as in the typical form. Of this form, Salvin and Godman's collection contains an example from Chyavetas (*Bartlett*).

But in none of these local forms is there any appearance of the black markings on the breast and upper back which distinguish the S.E.-Brazilian bird.

Malherbe (*l. s. c.*) has figured the Brazilian form with tolerable accuracy. We propose to name it *Celeus subflavus*, under which term it has long stood in Sclater's collection.

7. CHAMÆPELIA BUCKLEYI, sp. nov.

♂ *griseo-vinaceus, pileo summo et uropygio cinerascentioribus; fronte et corpore subtus vinaceis, gula albescentiore: maculis alarum sicut in* C. talcapoti, *sed majoribus: subalaribus et caudæ parte apicali fusco-nigris, primariorum tectricibus nigerrimis: rostro pallide brunneo: pedibus flavis: long. tota* 7·0, *alæ* 3·5, *caudæ* 2·7, *rostri a rictu* 0·7, *tarsi* 0·7.

♀ *mari similis, sed corpore supra brunneo-cinnamomeo nec vinaceo: subtus quoque brunnescentior et in abdomine medio albescens.*

Hab. Santa Rita, Rep. Æquat. (*C. Buckley*).

Mus. S.-G.

Obs. C. talpacoti affinis, sed maris coloribus vinaceis (sicut in *C. griseola*) nec saturate cinnamomeis distinguenda: a *C. passerina* et speciebus aff. subalaribus nigris diversa.

In this apparently distinct species, of which Mr. Buckley has sent

a pair, the male has the general coloration of *C. griseola*, but the black axillaries of *C. talpacoti* and *C. rufipennis*. The only described species of the latter section which we have not yet succeeded in recognizing is *C. godina*, Bp. (Consp. ii. p. 79) from Bolivia; but the character "uropygio tantum et tectricibus caudæ superioribus purpurascentibus" seems to preclude the possibility of the present bird belonging to that species. It may also be doubted whether *C. godina* is really distinct from *C. talpacoti*, inasmuch as we possess a specimen marked (with a doubt, however) by Bonaparte himself as *C. godina*, which is certainly only the female of *C. talpacoti*. The latter bird has several times been sent from Bolivia (*cf.* Bp. Consp. ii. p. 79, and Gray, List of Columbæ, p. 50, 1856); and we have examined specimens of it sent thence by Bridges which are now in the British Museum.

8. CRAX ERYTHROGNATHA, sp. nov.

Purpurascenti-nigra, ventre imo crissoque albis: cristæ plumis nigris, recurvis: loris nudis: cera et rostro basali rubris: hujus apice flavicante: pedibus in pelle sicca pallide corylinis: long. tota 28·0, *alæ* 16·0, *caudæ* 11·0, *tarsi* 4·5. Fem. *mari similis, sed cristæ plumis fasciis minutis albis variegatis.*

Hab. Columbia int.

Mus. S.-G.

Obs. Similis *C. alectori* et omnino ejusdem formæ sed rostro rubro diversa.

Of this near ally of *C. alector*, Salvin and Godman have recently obtained a pair of "Bogota" skins. As in that species, the female seems to be only distinguishable from the male by her slightly banded crest.

3. On new Species of Warblers in the Collection of the British Museum. By R. BOWDLER SHARPE, F.L.S., F.Z.S., &c., Senior Assistant, Zoological Department, British Museum.

[Received December 29, 1876.]

(Plate II.)

All the species described in this paper have been added to the national collection during the past year; and as they are of considerable interest, I lose no time in bringing them before the Society. They are from Africa and Madagascar.

APALIS CERVINIVENTRIS, sp. n.

Supra brunneus, uropygio et supracaudalibus vix rufescenti-fulvis: tectricibus alarum dorso concoloribus: remigibus saturate brunneis, dorsi colore extus lavatis: cauda brunnea, obscure undulata: pileo summo nuchaque nigris: facie laterali quoque



Smit. ad.

1. BÆOCERCA FLAVIVENTRIS.
2. DROMÆOCERCUS BRUNNEUS.



nigra: genis et gula fulvescentibus: plaga magna jugulari nigra: corpore reliquo subtus aurantiaco-fulvo, abdomine medio pallidiore: tibiis brunneo lavatis: subalaribus aurantiaco-fulvis: rostro nigro: pedibus brunneis, unguibus flavidis. Long. tot. 4·7, *culm.* 0·55, *alæ* 2·0, *caudæ* 1·85, *tarsi* 0·85.

Hab. Gold Coast, W. Africa.

The description is taken from a specimen obtained from the Gold Coast. The British Museum contains a second example formerly in my own collection, which I received from Denkera from the native collector Aubinn, who was for some time working for me. This specimen is not in such good condition as the type, being imperfect about the tail; in general coloration, however, it is similar, excepting as regards the throat, which is entirely black, extending onto the fore neck, the sides of the latter being deep orange chestnut. I believe this to be the male bird, and the one described to be the female of a new species of *Apalis*, which is not closely allied to any of the members of the African Sylviidæ at present described.

BÆOCERCA FLAVIVENTRIS, sp. n. (Plate II. fig. 2.)

Supra olivascenti-viridis, tectricibus alarum dorso concoloribus: remigibus et rectricibus brunneis olivascenti-viridi marginatis, primariis extus flavo-limbatis: pileo cinerascenti-brunneo: loris et superciliis distinctis brunnescenti-fulvis: facie laterali brunnescenti-fulva, regione parotica anguste albo striata: genis brunneo maculatis: gutture toto brunnescenti-fulvo: corpore reliquo subtus sulphureo, crisso et subcaudalibus albicantibus: corporis lateribus olivascenti-viridibus: tibiis flavis: subalaribus flavis: remigibus infra cinerascenti-brunneis intus fulvescenti-albo marginatis. Long. tot. 2·9, *culm.* 0·45, *alæ* 1·95, *caudæ* 0·7, *tarsus* 0·65.

Hab. Gold Coast.

Of the same form as *Bæocerca virens* of Gaboon, but distinguished by its yellow belly, which is white in the Gaboon species. Two specimens collected by Governor Ussher on the Gold Coast were formerly in my own collection, and now form part of that of the British Museum.

DROMÆOCERCUS, gen. n.

Closely allied to *Phlexis*, Hartlaub, but distinguished at once by its pointed and loosely webbed tail-feathers, the webs being separate and distinct, as in an Emu-plume: hence the generic name.

The type is

DROMÆOCERCUS BRUNNEUS, sp. n. (Plate II. fig. 1.)

Supra rufescenti-brunneus, tectricibus alarum dorso concoloribus: remigibus nigricantibus extus sordide rufescentibus: rectricibus saturate brunneis, rachibus nitide nigris: loris rufescentibus: subtus dilutius rufescenti-brunneus: gutture pallidiore: subalaribus pectore concoloribus. Long. tot. 5·9, *culm.* 0·45, *alæ* 1·95, *cauda* 2·5, *tarsi* 0·75.

Hab. Madagascar.

This interesting little Warbler was sent by Mr. A. Kingdon from Madagascar, having been procured by that gentleman during a holiday excursion in the neighbourhood of Antananarivo. The form of this new genus is closely allied to *Phlexis*, of which *P. layardi*, of South Africa, is the type; but it differs in the form of the tail, which is composed of long loose feathers of lax texture with distinctly separated webs, very much as in *Stipiturus* of Australia. The typical specimen was presented to the Museum by Mr. Algernon Peckover, of Wisbech, to whom its discoverer Mr. Kingdon had forwarded it.

4. Notes on British Freshwater Mites. By George Stewardson Brady, M.D., F.L.S., C.M.Z.S., Professor of Natural History in the College of Physical Science, Newcastle-on-Tyne.

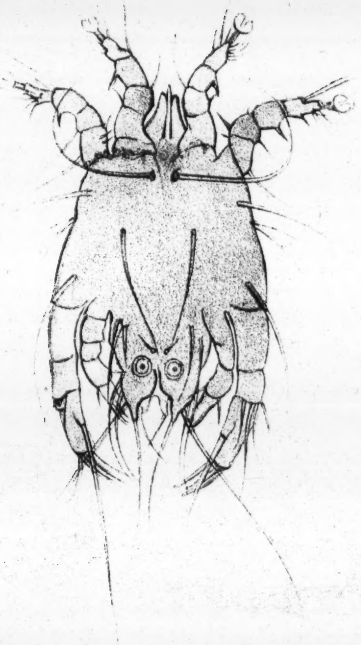
[Received December 7, 1876.]

(Plates III. and IV.)

Though *Acari* occur pretty abundantly at various depths in the sea, extending, indeed, from the littoral zone to a depth of several fathoms, I am not aware that any species have been recorded as living in fresh water; and it is unfortunate that, in the case of those which form the subject of the present paper, I am not able to say with absolute certainty that they really *lived* in the water whence they were taken. It is just possible, though not (as I think) at all likely, that some of them may be terrestrial species which have been washed accidentally into the lakes or ponds in which I found them. Against this view, however, the perfect preservation of the specimens, and the fact of their belonging to unknown species, must be allowed considerable weight. I hope before long to be able to investigate the matter more closely, and to satisfy myself as to the real habitat of these little creatures.

As regards *Trombidium fuscum*, at any rate, there can be no reasonable doubt: it has been found in so many places and in such abundance as to leave no misgiving as to its aquatic habitat. With this fact placed beyond doubt, and remembering that a closely allied family, the *Hydrachnæ*, occurs in great profusion in fresh water, there need scarcely be much hesitation in accepting as truly aquatic the species which I here venture to describe as new.

The literature of the Acarina is much scattered; and I have had no opportunity of reference to some important papers by Nicolet, Claparède, &c. The generic definitions given by Dugès, on which I chiefly depend, seem to require revision and amplification. At present it is not an easy matter to refer a new species to its proper genus; and it is quite possible that some of those now under consideration may eventually be found to belong to genera other than those to which I have assigned them.

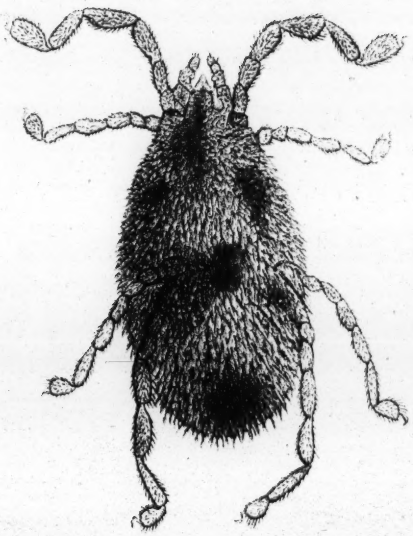






G. Brady del. Hannay imp.

1. ICHTHYOSOMA LONGISETOSUM.
2-5. RAPHIGNATHUS SPINIFRONS.









PARNOPIDES BISPINUS
& PARNOGATHUS NIGRESCENS

Class ARACHNIDA.

Order ACARINA.

Family TROMBIDIADÆ.

Genus RAPHIGNATHUS, Dugès.

RAPHIGNATHUS SPINIFRONS, nov. sp. (Plate III. figs. 2–5.)

Carapace strong and horny, entire, tapering to an acute point in front, broadly rounded behind, notched at the insertions of the legs. Mandibles (fig. 4) stylet-shaped, projecting about as far as the rostrum; palps short and thick, obtuse, armed with a few long hairs, and near the apex with four short claw-like setæ (fig. 3, *b*). Coxæ contiguous, all arising from the anterior half of the body; legs five-jointed; terminal joint very long and slender, tapering much towards the apex, antepenultimate joint very small, basal joint short. The claws are three in number (fig. 5) on each limb, and are moderately curved. The side of the carapace just behind the rostrum (fig. 3) is produced into four strong spines. The last three joints of all the legs bear numerous long hairs; and the penultimate joint of the first pair is provided also at its outer apical angle with a single very long seta, which reaches beyond the extremity of the limb itself. Eyes not seen. Colour of the carapace dark brown, opaque; of the limbs a clear reddish-brown. Length $\frac{1}{33}$ of an inch.

Two examples of this species were found amongst a gathering of Entomostraca taken in Crag Lake, Northumberland, in September 1876. It seems to be very nearly allied to a terrestrial species described by Dr. George Johnston, in the 'Transactions of the Berwickshire Naturalists' Club,' under the name of *Carabodes nitens*. Besides the difference of colour, however, which in Dr. Johnston's species is "pitch-black," there appear to be important distinctions (perhaps of generic value) in the structure of the mandibles and palps; nor in the description of *C. nitens* is there any note of spinous armature of the carapace.

Genus RHYNCHOLOPHUS, Dugès.

RHYNCHOLOPHUS HISPIDUS, nov. sp. (Plate IV. figs. 1–3.)

Body soft, apparently destitute of any chitinous carapace; oblong-ovate, covered with thickly set hairs, which are short on the anterior half but longer behind; the limbs also are densely hispid, especially towards the distal extremities. Coxæ distant; *i. e.* the first two pairs of legs are separated from the hinder pairs by a long interval. Mandibles short, included in a short triangular sheath; palps short and stout, the terminal joint wide (fig. 2), and having externally a cushion-like hairy papilla, and internally a short strong claw. The limbs are rather slender the fourth pair the longest, second shortest, third and first pairs nearly equal: the first two joints are, in all the limbs, small, the rest being nearly of equal length except in the two hinder pairs, where the terminal joints are small. The last joint in all the limbs is considerably dilated (fig. 3), and is armed with two

strong slightly falcate claws. Colour, pale yellowish-brown. No eyes were visible. Length $\frac{1}{14}$ of an inch.

One specimen only of this curious species was found, in an old engine-pond at Murton Junction, county Durham.

Genus TROMBIDIUM, Fabr.

TROMBIDIUM FUSCUM, mihi.

Trombidium fucicolum, Brady, P. Z. S. 1875, p. 303 and woodcut, p. 304.

It is necessary to alter the specific name of this Mite. The examples from which I described it were taken by my friend Mr. Robertson, of Glasgow, among the roots of *Fuci* in Roundstone Bay; but I have since noticed it in abundance in several freshwater gatherings, and it is probable that the Roundstone specimens may have been washed out of the adjacent peat-bogs, in the pools of which the little animal occurs plentifully. In any case the name *fucicolum* is inappropriate. The freshwater localities in which I have taken it are as follows:—Bog-pools, near Clifden (Connemara), ditches (slightly brackish) near Newport (Mayo), Kinny Lough (Donegal), Crag Lake and Capheaton Lake (Northumberland).

A specimen which appears to be the male of this species differs in being more slender, and in having four long setæ attached to the posterior extremity of the body.

Genus PACHYGNATHUS, Dugès.

PACHYGNATHUS (?) NIGRESCENS, nov. sp. (Plate IV. figs. 4, 5.)

Body broadly ovate, posterior extremity obtusely pointed, rostrum short and broad. The four pairs of legs are nearly equal in length, short and stout, scarcely more slender at the apex than at the base; the third joint more tumid than the rest; the apex and sides of most of the joints bear a few short rigid setæ; terminal claws, two on each foot (fig. 5), bent at right angles and fringed with a comb-like series of fine cilia. The integument, both of body and limbs, is marked with closely set impressed circular puncta, which, however, are less distinctly seen on the body, owing to the very opaque and darkly coloured contents of the animal. The entire body and limbs are marked with cloudings of dark blackish-green, apparently arising from the darkly coloured internal parts showing through the skin. Eyes not visible. Length $\frac{1}{35}$ of an inch.

This species was taken in Crag Lake, Northumberland; but as only one specimen was found, I have been unable to dissect it so as to ascertain the structure of the mouth-apparatus. In general appearance it is very like the marine *Pachygnathus sculptus*; but the sculpturing of the integument is much more vague and indefinite, the limbs less slender, and the claws altogether different in shape.

Family Acaridæ.

Genus Schistosoma, nov. gen.[1]

In general appearance resembling *Sarcoptes*; posterior portion of the body divided into two wide triangular processes; two hinder feet entirely different in structure from the anterior pairs, and projecting directly backwards from the back of the body, the anterior legs also arise from the truncate anterior margin of the body.

Schistosoma longisetosum, nov. sp. (Plate III. fig. 1.)

Body subquadrate, truncate in front; rostrum obtuse and prominent, posterior extremity divided into two triangular pointed laminæ, each of which bears several terminal setæ, one pair of which is excessively long; near the centre of each lamina is a circular organ, not unlike the caudal auditory organ of *Mysis*. The two anterior pairs of legs are short and robust, each bearing a few setæ and one or two marginal spines. The terminal joints of the posterior legs are divided into several slender segments and are destitute of claws; those of the third pair bear one very long and a few smaller setæ; the anterior legs terminate apparently in delicate suctorial disks. Behind the rostrum arise, one on each side of the median line, two long setæ which project first laterally and then forwards, reaching nearly to the extremities of the feet. Several pairs of somewhat shorter setæ arise from the margins and central portion of the body. The animal is pale coloured; and the integument appears to be less dense and horny than in most aquatic *Acari*. No eyes were visible. Length $\frac{1}{50}$ of an inch.

One specimen only of this remarkable species was noticed in a gathering of *Entomostraca* taken by Mr. Robertson in an old canal at Peterhead.

EXPLANATION OF THE PLATES.

Plate III.

Fig. 1. *Schistosoma longisetosum*, magnified.
2. *Raphignathus spinifrons*, magnified.
3. The same. Rostrum, palp, and portion of front of carapace.
a. Rostrum; *c*. Margin of anterior portion of carapace; *b*. Palp.
4. Mandibles.
5. Extremity of a foot, with claws.

Plate IV.

Fig. 1. *Rhyncholophus hispidus*, magnified.
2. Extremity of palp.
3. Extremity of foot, with claws.
4. *Pachygnathus nigrescens*, magnified.
5. Extremity of foot, with claws.

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[1] σχίζω, to split; σῶμα, body.

January 16, 1877.

Professor Newton, F.R.S., V.P., in the Chair.

Mr. Sclater exhibited a collection of Mammals, Birds, and Insects which had been formed by the Rev. George Brown, C.M.Z.S., during his recent residence in Duke-of-York Island and his excursions to the neighbouring islands of New Britain and New Ireland, with the assistance of a collector, Mr. Cockerell. The general facies of the collection was strongly Papuan. Mr. Sclater pointed out the great interest which attached to the fauna of these islands, as showing many representatives of some of the most marked characteristic forms of New Guinea, and promised further details, on the collections which had been transmitted to him to be worked out, at a future meeting of the Society.

A communication was read from Mr. G. Krefft, C.M.Z.S., containing some notes on a young example of *Casuarius australis* living in Sydney, which was destined for the Society's Collection.

The following papers were read:—

1. On the Birds of the North Polar Basin. By Capt. H. W. Feilden, C.M.Z.S.

[Received January 16, 1877.]

I shall endeavour in the few remarks I make this evening to draw your attention especially to the distribution of bird-life along the shores of the Polar Basin between the latitudes of 82° and 83°, the most northern land ever yet visited by human beings. I shall not allude to the ornithology of the West-Greenland shores and that of Baffin's Bay, which we are well acquainted with through the labours of Sabine, Holböll, Reinhardt, and several other excellent Danish naturalists; but I will take you at one step to the 78° of N. lat. and draw your attention to the area lying between the 60° and 75° of W. long., and as far north as the 83rd parallel of N. lat., which embraces Smith's Sound, Kane's Basin, Kennedy Channel, Hall's Basin, Robeson Channel, and part of the shores of the great frozen Polar Basin. After pushing through the middle pack of Melville Bay and entering the "North Water" of the whalers, which usually extends in the summer months from Cape York to Cape Alexander, Arctic voyagers have always been impressed with the enormous numbers of the Little Auk (*Mergulus alle*) which frequent this region, attracted no doubt by the vast amount of suitable food which it contains. *Mergulus alle* breeds in countless numbers in the cliffs around Port Foulke; and for a most graphic account of the Aukeries I refer you to Dr. Hayes's description published in his interesting volume 'The Open Polar Sea.' At Port Foulke we found the surface-temperature of

the sea on the 28th July +35° Fahr.; on the 29th, after entering Smith's Sound, the temperature fell to +31°, rising again in Buchanan Strait to +34°, where birds were comparatively abundant both in species and in numbers. On the 4th of August in the main channel the temperature fell to +30° and +31°, rising again in the shallower waters of Franklin-Pierce Bay to +33°; and as we proceeded northwards up the main channel the water fell to +29°, which became its normal temperature until frozen over. I insert these observations on temperature because I am led from them to the conclusion that the distribution of the Arctic species of birds that derive their sustenance from the sea is dependent in a great measure on the surface-temperature of the sea-water. After crossing the North Water on the 29th July 1875, and passing north of Cape Isabella, *Mergulus alle* disappeared. A few Fulmars (*Procellaria glacialis*) followed the ship; but on the following day, when we were embayed in the ice off Cape Sabine, they had all left us. Taking shelter from the pack drifting down the Sound we found a commodious little harbour with open water close to Cape Sabine. There we found a colony of about 25 pairs of *Larus glaucus* breeding, the young nearly ready to fly. Some 6 or 7 pairs of Ivory Gulls (*Pagophila eburnea*) frequented this harbour; but we failed to discover their nesting-haunts. We noticed a pair of Ravens (*Corvus corax*); and many Eiders (*Somateria mollissima*) were breeding on the small islets, the eggs deeply incubated on the 1st of August. On the 4th of August we had worked round Cape Sabine into Buchanan Strait. There we noticed a few *Mergulus alle*, two or three examples of *Alca arra*, several *Sterna macrura*, and on shore several *Plectrophanes nivalis*, and a single example of *Ægialitis hiaticula*, which proved to be a ♀. On the 10th and 11th of August we found a few Eiders (*Somateria mollissima*) breeding on Norman-Lockyer Island, two pairs of *Sterna macrura* breeding, and one or two *Pagophila eburnea* hovering over pools and cracks in the floe. On the 14th of August, at Cape Hilgard, we found the Black Guillemot (*Uria grylle*) breeding in the limestone cliffs at an elevation of from 400 to 500 feet, and noticed a solitary *Larus glaucus* cruising along the shore. Our sportsmen also procured that day on the shores of Dobbin Bay a ♀ and ♂ adult *Lagopus rupestris* and three young ones. A flock of three Turnstones (*Strepsilas interpres*) passed the ship, flying south; I shot one, a bird of the year. August 16th, near Hayes point, Mr. Hart observed a pair of White Falcons (*Falco candicans*) nesting in a lofty cliff. A few miles further north I saw a pair of Ivory Gulls nesting in a high precipice; but it was impossible to reach the spot. On August 13th, when embayed in the ice near the shore in N. lat. 79° 37′, Black Guillemots were observed to be nesting in the cliffs in considerable numbers.

During our run from Cape Collinson through Kennedy Channel, which was comparatively open, to Bessel's Bay I did not notice a single bird; but in Bessel's Bay Black Guillemots (*Uria grylle*) were numerous, and a considerable number of *Somateriæ* with their young broods were seen on the 23rd of August. Discovery Bay was

reached on the 25th of August: 81° 44′. There we saw several examples of *Tringa canutus* in small flocks, evidently migrating south. These birds were already in winter plumage. I also observed several Turnstones. On the 26th of August I found eight or ten pairs of *Sterna macrura* breeding on a small islet at the entrance to Discovery Bay. The land by this date was covered with autumn snow; but I found a downy living young one in a nest from which the old birds had scooped out the snow and piled around the depression. Sept. 1st, 1875, I observed a single Ivory Gull flying round the ship in Lincoln Bay; and during a pelting snow-storm, as we rounded Cape Union in 82° 15′ a single *Strepsilas interpres* hovered for a short time under the lee of our ship. On that day we attained our highest northern latitude in the vessel, viz. 82° 28′; and as we ran in for shelter from the pack, between the shore and the grounded hummocks I saw a family party of *Harelda glacialis*, 7 or 8 in number, seated on a small piece of ice. Landing, I waded knee-deep through soft snow which then covered the shore, but failed to get a shot. I also saw a fine *Larus glaucus*, which I tried to stalk in vain. Sept. 2, a single Dovekie (*Uria grylle*) flew past the ship, flying south, the last of this species observed that year. Sept. 5th, Markham and Aldrich, at Dumbell Harbour, in lat. 82° 30′, came across 11 Eiders, three old females and their broods, in a tide-crack. They killed five with their rifles, but were not able to get hold of any of them, the ice around the crack being too treacherous. They also observed a single Turnstone. Sept. 19th, a pair of *Harelda glacialis* alighted in a pool near the ship and were obtained. Sept. 29th, near Point Hercules, in lat. 82° 40′, the autumn sledgers observed four *Lagopus rupestris* in winter plumage. Oct. 2nd, I observed a Snowy Owl seated on the top of a hummock, about a mile from our winter quarters. After this over five months elapsed before any feathered creature reappeared; but in the afternoon of the 11th March, 1876, the quartermaster on watch reported three white birds as having flown past the ship. They were probably *Lagopus rupestris*, as a few days after, on the 17th, tracks of these birds were observed in the snow at various points within a few miles of the ship. On the 29th March Lieut. Parr saw a Snowy Owl, very wild. On the 13th May, 1876, I heard the first Snow-Bunting (*Plectrophanes nivalis*), as we lay in our tent on the floe at the base of a cliff. The note came from above, clear and musical, and each inmate of the tent started into a sitting posture, and said "Hush, hush, do you hear it?" One of the sailors said to me, "What bird is that, sir? it is sweeter than a throstle." On the return of the northern sledge-party, Lieut. Parr on the 27th May met with a straggling Snow-Bunting near to the 83° of N. lat. So this species can claim for itself the highest northern range yet recorded of any bird. June 5th, whilst travelling in lat. 82° 33′, I observed the first Knots, Sanderlings, and Turnstones; a flock of Brent Geese passed over our heads. June 6th, noticed first Long-tailed Skuas (*Stercorarius longicaudatus*). June 24th, noticed first *Somateria spectabilis*.

The following is a systematic list of the species of birds met with along the shores of the Polar Basin:—

1. Nyctea scandiaca.

Several pairs seen; found breeding. Feeds on Lemmings.

2. Plectrophanes nivalis.

Generally dispersed; breeding.

3. Lagopus rupestris.

Undoubtedly breeding, but nest not found. About ten brace were killed by various members of the ship's company; I killed one in 82° 46′.

4. Strepsilas intepres.

A few pairs observed, undoubtedly breeding; but though we searched long and carefully, we did not find the nest.

5. Calidris arenaria.

A few pairs noticed. Obtained breeding in 82° 33′ N. lat.

6. Phalaropus fulicarius.

I noticed this bird twice—a ♀ killed near the ship in lat. 82° 27′, and a pair, evidently breeding, on a small lake in lat. 82° 30′.

7. Tringa canutus.

The commonest of the Waders, remains in flocks the whole summer. Very wild, but breeding. Unable to find nest; but we captured the young in down.

8. Sterna macrura.

Not uncommon; we noticed 6 or 8 pairs scattered along the coast-lines we visited. Found breeding.

9. Larus glaucus.

Observed on several occasions, but only as a straggler.

10. Stercorarius longicaudatus.

Scattered along the coast; every two or three miles a pair were to be found breeding. They live on Lemmings.

11. Procellaria glacialis.

A single example picked up dead in lat. 82° 30′.

12. Uria grylle.

Two examples observed, one in the autumn of 1875, the other in June 1876; evidently stragglers.

13. Colymbus (species uncertain).

Seen 2nd September, 1875.

14. Harelda glacialis.

A few pairs, undoubtedly breeding. Nest not discovered.

15. SOMATERIA SPECTABILIS.

The only Eider noticed north of Cape Union; breeding in limited numbers.

16. BERNICLA BRENTA.

Not uncommon along the shores of the Polar Basin, breeding.

2. Notes on some of the smaller Mammals of the Argentine Republic. By HENRY DURNFORD.

[Received December 18, 1876.]

[Mr. Henry Durnford, now resident near Buenos Ayres and well known as a diligent collector of birds, has sent me specimens of three small Mammals, with the subjoined notes on their habits. I trust he may be induced to continue his researches in this department, as the smaller Rodents of La Plata are still very imperfectly understood. Mr. Alston has kindly determined the species.—P. L. S.]

1. HESPEROMYS VULPINUS (Licht.); Burm. Syst. Ueb. Th. Bras. i. p. 163.

This Rat is not common, and from its habits and the inaccessible places it frequents is difficult to obtain. Hitherto I have only found it in lagunes to the north of Buenos Ayres, where the reeds and aquatic plants afford plenty of cover. In these extensive swamps it lives, making a large oval nest of rushes and grass, the finer fibres towards the interior, and generally building its dwelling about a foot above the water, amongst the reeds, but sometimes higher than this. It swims and dives with great ease and rapidity. Its food, so far as I have observed from the only two specimens I have obtained, consists of aquatic weeds and grass.

2. HESPEROMYS ELIURUS, Wagner; Burm. op. cit. p. 173.

This Mouse is found in the same places as the preceding species, and is much more common than that animal. It lives amongst thick reeds, making a small oval nest of grass and fine rushes. Its chief peculiarity is the length of its hind legs, which enables it to take enormous leaps for so small an animal; and this is very necessary, as its only means of escape is by jumping from its nest, sometimes three feet above the water, into the weeds which cover the surface of the lagunes. It dives and swims with great rapidity. It is very often found in the nests of *Synallaxis melanops*, which are numerous, and generally about the same height above the water as its own.

3. DIDELPHYS CRASSICAUDATA (Desm.).

This is the *Comadreja colorada* of the country. It is rare, lives in old hollow trees, roofs of houses, &c., and sometimes commits great havoc in the poultry-yard. The other species of Comadreja[1] is quite common.

[1] [*Didelphys azaræ*?—ED.]

3. Note on the Solid-hoofed Pigs in the Society's Collection. By A. H. Garrod, F.R.S., Prosector to the Society.

On November 2nd, 1876, there arrived in the Gardens a pair of Pigs (domestic variety) presented to the Society by Don J. Alfonso de Aldama, from Cuba, peculiar in that the hoofs of all the feet, instead of being cloven, are solid, much resembling those of the Ass, with the lateral diminutive digits as they are always found in the Pig.

The sow gave birth on November 15th to a litter of six, three males and three females. Of these the hoofs were solid (like those in the parents) in three, namely in two males and one female. In the remaining male and two females the hoofs were double, as in the animal under ordinary circumstances.

Four of the young pigs are now living (a pair of solid-hoofed and a pair of normal-hoofed), a male solid-hoofed and a female split-hoofed specimen having died within a few days of birth.

On examining the feet of the deceased male solid-hoofed specimen, it was seen, as might have been inferred from an inspection of the living animals, that all the monstrosity is confined to the ungual phalanges. The proximal and second phalanges are separated as usual, whilst at the extreme distal ends of the ungual phalanges these bones are completely fused together; and, further, there is a third ossicle developed at their proximal ends, where they are not completely united, between and above them.

It might have been imagined that the deformity was simply the result of an agglutination along the middle line of the two completely formed digits; but such is not the case, the nail-structure being absent in the interval, where it is replaced by bone with a transverse cartilage below it. The nail is continued straight across the middle line of the hoof, as in the horse. In Mr. Darwin's 'Animals and Plants under Domestication' (ed. 2, vol. i. p. 78), a full account will be found of several cases in which an exactly similar deformity existed.

4. Description of a New Species of *Helix* from South Australia. By George French Angas, C.M.Z.S.

[Received January 9, 1877.]

Helix (Rhagada) kooringensis, n. sp.

Shell umbilicated, somewhat globosely lenticular, rather thin, strongly obliquely flexuously corrugated, the corrugations more or less elevated and irregular, the interstices crossed with short, impressed, interrupted, transverse lines, especially on the basal portion of the last whorl, cretaceous, white; spire flatly conoidal, apex obtuse, sutures impressed; whorls 5, slightly convex, the last very strongly flatly carinated, not descending in front, the base tumid

around the umbilicus; aperture oblique, subquadrate; outer lip simple; columella arcuate, slightly thickened and partly expanded over the umbilicus.

Diam. maj. 1 inch, min. 10 lin., alt. 6 lin.

Hab. Found 30 miles in a N.E. direction from the Burra Mines, South Australia (*F. G. Waterhouse*).



This remarkable species is very similar in the character of its sculpture to *H. silveri*, Ang.; but the corrugations are less regular, the umbilicus is larger, the shell is flattened, and the last whorl very prominently keeled.

5. Descriptions of two Genera and twenty Species of Marine Shells from New South Wales. By George French Angas, C.M.Z.S., F.L.S., F.R.G.S., &c.

[Received January 11, 1877.]

(Plate V.)

Purpura (Cronia) anomala, n. sp. (Plate V. fig. 1.)

Shell ovately fusiform, rather solid, ornamented with a brownish-orange band spotted with black encircling the last whorl, and appearing again just above the sutures of the upper whorls, and with irregular undulating longitudinal chestnut lines, strongest near the base of the last whorl; whorls 5, angulated at the upper part, distantly longitudinally ribbed, the ribs stout and rounded and becoming swollen and nodulous above, transversely finely ridged throughout; spire elevated, apex sharp; aperture elongately ovate; outer lip arcuate; columella nearly straight, with a moderate callus overlapping the pillar.

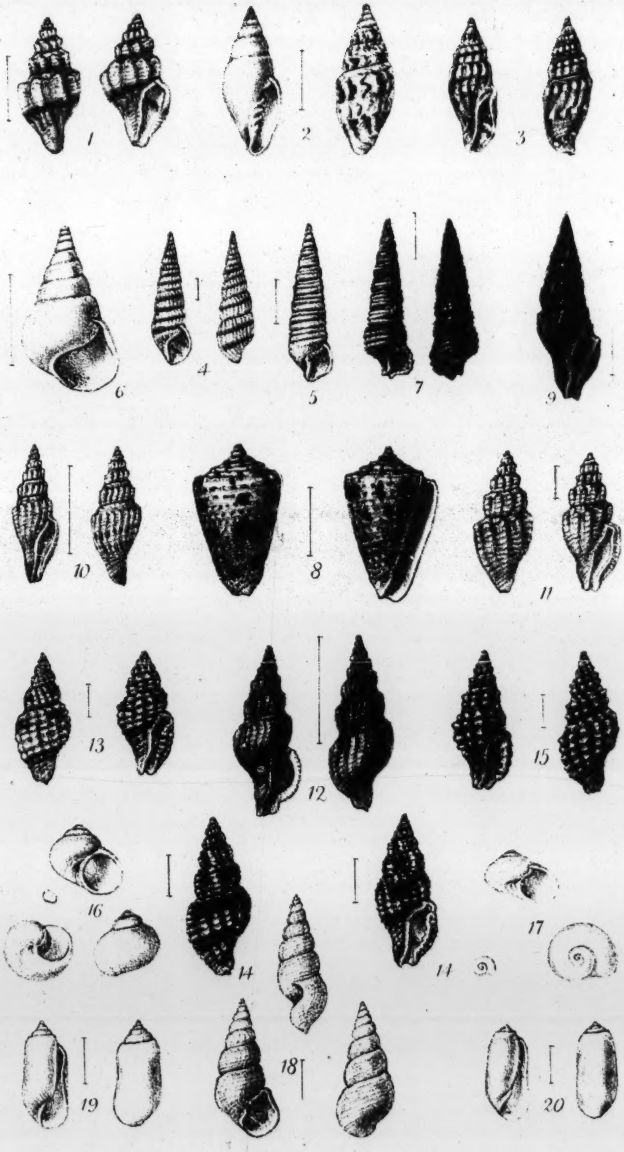
Length 4½, breadth 2 lines.

Hab. Dredged outside Port-Jackson Heads, in 25 fathoms (*Brazier*).

A curious little shell, from deep water, which I have placed provisionally in Messrs. H. and A. Adams's subgenus *Cronia*, represented by the *Purpura amygdala*, Kien.

Genus Microvoluta, Angas.

Shell small, ovately fusiform, solid, smooth, shining; spire as long as the aperture, apex papillary; whorls simple; aperture narrowly ovate; columella with 4 strong transverse plaits, the anterior



G. Sowerby lith. Hanhart imp.

NEW SPECIES OF MARINE MOLLUSCA
from New South Wales

one the smallest; outer lip thin, simple, slightly contracted at the base; base rounded, spout-shaped, with a flexuous bend upwards towards the columella, which is a little thickened and reflected below the plaits.

MICROVOLUTA AUSTRALIS, n. sp. (Plate V. fig. 2.)

Shell ovately fusiform, solid, smooth, shining, with very fine longitudinal lines of growth, white, or ornamented with two rows of distant irregular chestnut blotches and zigzag lines; spire elevated, apex obtuse, papillary; whorls $5\frac{1}{2}$, slightly convex; aperture narrowly ovate; outer lip simple, a little contracted below; base rounded; columella furnished with four prominent transverse plaits.

Length 5 lines, diam. $1\frac{3}{4}$ line.

Hab. Dredged in 25 fathoms water, outside Port-Jackson Heads (*Brazier*).

The deep siphonal notch, and the toothed projection of the base of the pillar, so characteristic of the volutes, are absent in this curious little genus.

COLUMBELLA (ANACHIS) SPECIOSA, n. sp. (Plate V. fig. 3.)

Shell minute, fusiform, thin, subtransparent, green, ornamented with very fine undulating chestnut lines, and encircled by two bands of irregular square or crescent-shaped opaque white spots; whorls 5, the last longitudinally plicate above, smooth below.

Long. $1\frac{1}{3}$, lat. $\frac{1}{2}$ line.

Hab. Port Jackson (*Brazier*).

A very elegantly painted, minute shell, of great beauty.

TURBONILLA FESTIVA, n. sp. (Plate V. fig. 4.)

Shell acuminately turreted, semipellucid, white, ornamented with a narrow pale brown band at the centre of the whorls, two on the last whorl; whorls 8, rather convex, finely longitudinally plicate, the interstices, under the lens, crossed with extremely minute transverse punctured lines; sutures strongly impressed; the last whorl smooth at the base; aperture oblong-ovate; outer lip simple, arcuate.

Length 2 lines, breadth $\frac{3}{4}$ line.

Hab. Port Jackson; deep water (*Brazier*).

CINGULINA BRAZIERI, n. sp. (Plate V. fig. 5.)

Shell subulately turreted, moderately thin, whitish, shining; whorls 11, very slightly convex, with three flattened spiral ribs separated by a deep, narrow groove, the lowest rib the broadest; sutures impressed; base smooth, convex; aperture subquadrate; outer lip thin, arcuate; columella straight and slightly thickened.

Length 4 lines, breadth 1 line.

Hab. Port Jackson.

APICALIA GUENTHERI, n. sp. (Plate V. fig. 6.)

Shell globosely subulate, thin, subpellucid, shining, horn-coloured,

very finely longitudinally striated, and showing, beneath the lens, minute transverse striæ on the upper whorls; whorls 7, very slightly convex, flattened immediately below the sutures, the last large, inflated, and hardly subangulate at the periphery; apical whorls of spire wanting; sutures impressed; aperture semilunar, pointed behind and rounded in front; columellar margin arcuate, thickened towards the base; outer lip thin, simple, rounded, a little flattened above.

Long. 7, diam. 4½ lines.

Hab. New South Wales (coll. Brit. Mus.).

This curious species I have provisionally placed in Mr. Arthur Adams's genus *Apicalia* rather than among the true Stylifers. The family Styliferidæ requires revision.

CERITHIOPSIS PURPUREA, n. sp. (Plate V. fig. 7.)

Shell elongately acuminated, moderately solid, purplish brown, with the last rib on each whorl grey; whorls 11 or 12, encircled with rounded equidistant ribs, 4 to a whorl, the last smaller, an extra rib on the base of the last whorl, which is flattened and very minutely striated, the interstices finely longitudinally striated; nucleolar whorl sinistral; aperture quadrately ovate; outer lip thin; columella arcuate and produced in front.

Length 3½ lines, breadth 1 line.

Hab. Dredged off Shark Island, Port Jackson.

This species differs from *C. crocea*, Ang., in being smaller and more cylindrical, with a narrower base, in its style of colouring, and in having the lateral outline less rectilinear. A variety occurs of a pale livid brown colour.

CONUS (STEPHANOCONUS) SMITHI, n. sp. (Plate V. fig. 8.)

Shell small, stoutly conoidal, irregularly, faintly, longitudinally striated by the lines of growth, finely transversely grooved towards the base, straw-colour clouded with pale chestnut; the upper whorls ornamented with distant dark chestnut flames, a few scattered spots of the same colour, indicating two bands, occurring on the body-whorl, which is encircled throughout with equidistant narrow fillets of a pale hue closely reticulated with chestnut spots; spire elevated; whorls turreted, concave, radiately lirate; apex papillose; aperture rather wide, the outer lip angled above at its junction with the whorl, nearly straight, and parallel to the columella.

Length 5, breadth 3 lines.

Hab. Cape Solander, Botany Bay (*Brazier*).

A very prettily painted little species, belonging to the same section as *C. rutilis*, Menke.

DRILLIA ÆMULA, n. sp. (Plate V. fig. 9.)

Shell elongately ovately fusiform, purplish brown; whorls 10, strongly carinated a little below the sutures and sharply angulated in the middle, below which descend irregular longitudinal ribs nodulous at the angle, strongly transversely ridged below the angle, and more finely above, the upper space between the angle and the

suture being crossed with delicate crescent-shaped descending striæ; spire sharp; aperture elongately ovate; outer lip simple, a little contracted below; posterior sinus moderate; canal short, scarcely recurved.

Length 1 inch, breadth 4 lines.

Hab. Coasts of New South Wales.

This species is allied to *D. harpularia*, Des Moul., from South Australia, but differs from it in having transverse ribs on the lower whorl, and being nodulous at the summits of the longitudinal plicæ. The aperture also differs in form.

There are specimens of this shell in the British Museum, from New Zealand, which have the ribs and nodulous sculpture more prominent than in the type. There are also 2 examples of a variety of a uniform dull yellow colour.

MANGELIA JACKSONENSIS, n. sp. (Plate V. fig. 10.)

Shell elongately fusiformly turreted, solid, pale fulvous yellow; whorls 7, angulated and flattened at the upper part, longitudinally somewhat prominently ribbed, the ribs slightly nodulous at the angle of the whorl, the interstices crossed with narrow grooved lines in pairs, which are interrupted by the longitudinal ribs; aperture elongately ovate; outer lip thin, simple; base of columella sometimes tinged with brown; posterior sinus very shallow.

Length 7, breadth 2 lines.

Hab. Dredged off Port-Jackson Heads in 25 fathoms (*Brazier*).

MANGELIA FLAVESCENS, n. sp. (Plate V. fig. 11.)

Shell ovately fusiformly turreted, solid, pale buff, sometimes tinged with yellowish orange on the ribs; whorls $6\frac{1}{2}$, conspicuously angled below the sutures and longitudinally distantly stoutly ribbed, the ribs sharply nodulous at the angle, the lower half of the last whorl finely transversely ridged; aperture elongately ovate, outer lip flattened inwards; posterior sinus moderate, slanting upwards.

Alt. $2\frac{1}{3}$ lines, diam. $1\frac{1}{4}$ line.

Hab. Port Jackson (*Brazier*).

In one specimen the ribs are suffused with orange at the angle.

CLATHURELLA BRENCHLEYI, n. sp. (Plate V. fig. 12.)

Shell fusiformly turreted, moderately solid, light brown inclining to ash-colour towards the apex; whorls 8, slightly angulated at the upper part, and somewhat compressed next the sutures, longitudinally more or less prominently ribbed, the ribs crossed with regular elevated ridges, which are less distinct below the sutures, from which descend very fine and close-set crescent-shaped striæ as far as the angle of the whorl, crossing the concentric lines; spire sharp, apex dark brown or purple; aperture elongately ovate, brown within; outer lip denticulated at the edge, crenate within, and margined with white; posterior sinus broad and shallow; canal short, wide, and recurved.

Length 9, breadth 3 lines.

Hab. Port Stephens, New South Wales (*Brazier*).

CLATHURELLA RUFOZONATA, n. sp. (Plate V. fig. 13.)

Shell fusiformly turreted, solid, white, sometimes with a zone of double interrupted chestnut lines near the base of the last whorl, similar chestnut markings being occasionally apparent here and there near the upper portion of the whorls; whorls 6, convex, longitudinally ribbed and crossed with transverse ridges that become sharply and prominently nodulous upon the ribs; spire sharp, apex light brown; aperture narrowly quadrate; outer lip varicose and denticulated; posterior sinus moderate.

Length $2\frac{1}{2}$ lines, breadth 1 line.

Hab. "Bottle and Glass" rocks, Port Jackson (*Brazier*).

A pretty little white species presenting a more or less beaded appearance all over, sometimes marked with interrupted transverse chestnut lines.

CLATHURELLA PUSTULATA, n. sp. (Plate V. fig. 14.)

Shell fusiformly turreted, moderately solid, white, irregularly longitudinally flamed with brown on the upper whorls, with two broad brown bands on the last whorl; whorls 6, convex, longitudinally costate, with about 10 rounded ribs, encircled by about the same number of narrow prominent ridges that become slightly nodulous at the intersections, the interstices showing, under the lens, very faint descending striæ; the lower portion of the basal whorl and the pillar strongly granulated; spire sharp; aperture elongately ovate; outer lip thickened and varied behind, dentate within; columella nearly straight above, slightly sinuous below; canal short and open; posterior sinus broad and shallow.

Length $3\frac{1}{2}$ lines, breadth $1\frac{1}{3}$ line.

Hab. Port Jackson (*Brazier*).

This species, which is prettily variegated with ash-brown, may be at once recognized by the stout granules at the base of the pillar.

CLATHURELLA MODESTA, sp. nov. (Plate V. fig. 15.)

Shell fusiformly turreted, solid, fulvous brown; whorls $5\frac{1}{2}$, convex, stoutly and distantly longitudinally ribbed, and crossed with prominent erect ridges becoming sharply nodulous at the intersection; spire sharp; aperture narrowly ovate; outer lip somewhat flattened and thickened, strongly dentate within; columella a little sinuous, with a few small granulations at the base of the whorl; posterior sinus rather broad.

Alt. $2\frac{1}{2}$ lines, diam. 1 line.

Hab. Port Jackson (*Brazier*).

Genus CIRSONELLA, Angas.

Shell minute, globosely turbinate, smooth, narrowly umbilicated; aperture circular; peritreme continuous, slightly thickened.

CIRSONELLA AUSTRALIS, n. sp. (Plate V. fig. 16.)

Shell globosely turbinate, narrowly umbilicate, semiopaque, smooth,

shining, white; whorls 4, convex; the last large, rounded at the periphery; aperture circular, peritreme continuous, slightly thickened on the columellar margin.

Alt. 1 line, breadth 1 line.

Hab. Found in shell sand, Botany Bay, New South Wales.

This little shell differs from *Crossea*, A. Ad., in the absence of the basal tooth so characteristic of that genus. It will not agree with *Putilla*, A. Ad., as in the latter genus the peritreme is not continuous; nor can it be referred either to *Microthyca*, A. Ad., or *Umbonella*, A. Ad. I place it provisionally amongst the *Trochidæ*.

ETHALIA BRAZIERI, sp. nov. (Plate V. fig. 17.)

Shell depressedly orbicular, white, shining, semitransparent, smooth, with numerous fine concentric impressed lines both above and below the sutures and at the base of the last whorl; whorls $3\frac{1}{2}$, rapidly increasing; suture impressed, with a narrow opaque band; last whorl rounded at the periphery; base slightly excavated; aperture subcircular; outer lip thin, arcuate; columella with a moderate callus expanded over the umbilical region.

Diam. 2 lines, alt. 1 line.

Hab. Shell sand, "Sow and Pigs" reef, Port Jackson (*Brazier*).

MYONIA SINUATA, n. sp. (Plate V. fig. 18.)

Shell elongately turreted, thin, semipellucid, white, transversely striated with narrow, equidistant, opaque diaphanous lines, and crossed on the last whorl with extremely delicate longitudinal striæ; whorls 8, convex; sutures channelled; aperture ovate, angled above, rounded below; columella arcuate, a little flattened and reflected over the body-whorl; outer lip deeply sinuous above, forming a sharp angle at its junction with the last whorl, rounded and effuse below.

Alt. $3\frac{1}{3}$ lines, diam. $1\frac{1}{2}$ line.

Hab. Dredged on the "Sow and Pigs" bank Port Jackson (*Brazier*).

Although in this shell the slight plait or twist on the columella is not discernible, it otherwise resembles a *Myonia*; and I have therefore placed it in that genus, which belongs to the *Acteonidæ*, rather than with *Monoptygma* or *Menestho*. The sinuous outer lip is a remarkable feature in this species.

TORNATINA HOFMANI, n. sp. (Plate V. fig. 19.)

Shell cylindrical, white, very finely striated by the lines of growth, with a few distant irregular transverse striæ discernible towards the lip on the body-whorl; whorls $5\frac{1}{2}$, the upper ones slightly convex, and channelled at the sutures, the last a little shouldered above and very slightly concave in the middle; apex sharp; aperture narrow above, dilated below, and rounded at the base; outer lip thin, arched when viewed laterally, and slightly contracted in the middle; columella somewhat thickened below, with a small blunt flexuous pro-

jection near the base, and covered by a callus extending nearly to the top of the whorl.

Length $3\frac{1}{2}$ lines, breadth $1\frac{1}{2}$ line.

Hab. "Sow and Pigs" reef, Port Jackson (*Brazier*).

TORNATINA BRENCHLEYI, n. sp. (Plate V. fig. 20.)

Shell ovately cylindrical, white, shining, very finely striated by the lines of growth, and exhibiting only faint traces of spiral striation; whorls $4\frac{1}{2}$, the two apical ones forming a small tubercle, the rest somewhat elevated, turreted, and separated by a deeply but not broadly channelled suture; aperture narrow above, gradually dilating and curved at the base; the outer lip not extending to the top of the whorl and slightly contracted in the middle; the columella furnished with a stout callous plication, which is connected above with the labrum by a thin callous deposit on the whorl.

Length 3 lines, breadth $1\frac{1}{4}$ line.

Hab. Dredged outside Port-Jackson Heads in 10 fathoms water (*Brenchley*), coll. Brit. Mus.

EXPLANATION OF PLATE V.

Fig. 1. *Purpura* (*Cronia*) *anomala*, p. 34.
2. *Microvoluta australis*, p. 35.
3. *Columbella* (*Anachis*) *speciosa*, p. 35.
4. *Turbonilla festiva*, p. 35.
5. *Cingulina brazieri*, p. 35.
6. *Apicalia guentheri*, p. 35.
7. *Cerithiopsis purpurea*, p. 36.
8. *Conus* (*Stephanoconus*) *smithi*, p. 36.
9. *Drillia æmula*, p. 36.
10. *Mangelia jacksonensis*, p. 37.
11. —— *flavescens*, p. 37.
12. *Clathurella brenchleyi*, p. 37.
13. —— *rufozonata*, p. 38.
14. —— *pustulata*, p. 38.
15. —— *modesta*, p. 38.
16. *Cirsonella australis*, p. 38.
17. *Ethalia brazieri*, p. 39.
18. *Myonia sinuata*, p. 39.
19. *Tornatina hofmani*, p. 39.
20. —— *brenchleyi*, p. 40.

6. Notes on *Eliomys melanurus* and on some other Rodents of Palestine. By H. B. TRISTRAM, F.R.S., C.M.Z.S.

(Plate VI.)

By far the richest part of the fauna of the desert-regions of Western Asia is its Rodents; and it is certainly that of which we know the least. Almost all the small mammals of the stony region south of Judæa, of the whole Sinaitic peninsula, and of the vast sandy and rocky expanses which stretch with little variation from Damascus and Moab to Bagdad, are crepuscular or nocturnal in their habits.



Explorers are well content if they can by great good fortune trap or shoot a chance specimen; but it is impossible for them to note, still less to study, the habits of these most interesting creatures. The inexorable fate of the eastern traveller is similar to that of the victim of the police. He must be always moving on. Yet with all these difficulties to contend against, I have obtained in those regions no less than 26 species of the smaller *Glires*, of the families *Spalacini*, *Murini*, *Merionides*, *Dipodidæ*, *Arvicolini*, *Myoxini*, omitting altogether Squirrels, Hares, &c. I am satisfied that this list could be very largely increased with time and opportunity; for Ihave myself observed many species which I could not succeed in capturing, especially Dormice and Hamsters. One might be easily accused of exaggeration in describing the countless numbers of holes and burrows in regions which for a great part of the year present the appearance of utter desert. Sometimes for miles a district has the appearance of one vast warren of pygmy rabbit-burrows; and yet for days, saving the bounding of a Jerboa here and there before one's horse, not a trace of rodent-life is to be seen. It is true very many of the holes are occupied by the various species of Chat (*Saxicolinæ*); but I have good evidence for believing that these birds only utilize existing burrows, from the fact that in digging out their nests, I have found traces of the original builders in the shape of their excreta, and also runs which had manifestly not been used by the birds.

Of the many species we have procured, I have had favourable opportunities of noting the habits of only one or two.

One of these, *Acomys dimidiatus*, a beautiful little isabel-coloured Mouse, with the cont of a Hedgehog, I watched for an hour or two among bare gravel near the Dead Sea. Its colour so perfectly harmonized with the pebbles that I could not have detected it had I not caught its eye as it was nibbling a root, puffed out like a little ball. As it ate, its quills lay smoothly back; but when it began, as it soon did, to scrape into the sand, its bristles were erect. Its food on this occasion was the bulb of a small crocus.

This explains the vast number of these various Rodents in this apparent desert. The larger proportion of the plants are bulbous or tuberous; and after a nine months' utter barrenness, the first winter rains soon carpet the waste with a brilliant spangling of bulbous flowers—crocus, iris, squills, asphodels, cyclamens, and others. Their glory is soon over; but the large succulent roots remain, retaining their moisture through the summer, and thus affording abundant nutriment to the little burrowers.

I much regret that we were singularly unfortunate in our attempts to shoot or trap one Rodent, which puzzled us much. It abounded on the uplands of Moab; and I have not noticed it elsewhere. It seemed not much smaller than a rabbit, and lived in colonies, never coming out till sunset. Soon afterwards one might hear rapidly reanswering cries, like a faint squeaking bark, and the little creatures were perched each at the mouth of a burrow, down which they disappeared instantaneously on the least alarm. It was in vain to attempt to dig for them, as the burrows were among the

ruins of ancient cities, and under the foundations of old walls, or else led into the fissures of natural rocks.

In the wooded districts we alsc noticed two or three species of Dormice or Palm-rats, all with tails more or less bushy, which eluded us.

The specimen which I exhibit of the *Eliomys melanurus* of Wagner (Abh. bay. Ak. Wiss. iii. p. 176, pl. ii. fig. 1), belongs to the only species obtained in my visit to Moab with which I had not previously met.

We obtained two specimens, one among the ruins of Um Rasas, standing in a treeless waste, the other at the old Roman city of Ziza. They were both trapped in their runs, near the mouth of a hole in the old wall. When let loose in a box, *Eliomys* is a very beautiful and interesting creature. The face, with the two broad black lines running to behind the ears, bordered with a fringe almost white on either side, and the large and moving ears, is most winning; and the tail as it moves slowly is curled up over its back, like a Squirrel's; but in running it is carried behind it. Altogether it is very squirrel-like in its movements. There is no difference in markings between the sexes; we procured one example of each. One of these is in my collection; the other is in the possession of its captor, the Rev. Mowbray Trotter, of Sheffield.

I much regret that I am unable to throw any further light on the habits of this rare and interesting creature; but the locality where our specimens were found confirms the account given by Wagner, that it inhabits holes in the ground. It is somewhat curious that no structural difference of any importance can be detected between it and its arboreal congeners. So far as I know, only two specimens are known to have existed in collections before we met with it in Moab. These were the types of Wagner's description, brought from the Sinaitic peninsula by Von Schubart; and as Wagner's illustration is rude and uncharacteristic (the animal being represented on a branch of a tree), one of our examples has been figured in the accompanying drawing (Plate VI.) in a more natural attitude.

February 6, 1877.

Osbert Salvin, F.R.S., V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of January 1877.

The total number of registered additions to the Society's Menagerie during the month of January was 46, of which 27 were by presentation, 17 by purchase, and 2 were received on deposit. The total number of departures during the same period, by death and removals, was 76.

Dr. Günther read a memoir on the Tortoises collected by Commander Cookson, R.N., during the recent visit of H.M.S. 'Peterel' to the Galapagos Islands.

Mr. Howard Saunders exhibited a specimen of the Panay Sooty Tern (*Sterna anæstheta*[1]), which had been obtained on the British coast on a light-ship, probably either at the mouth of the Thames or of the Medway.

This was stated to be the first notice of the occurrence of this bird within British limits.

Mr. Sclater called attention to the original and unique specimen of his *Manucodia comrii* (P. Z. S. 1876, p. 459), now belonging to the collection of the Marquess of Tweeddale, the President of the Society, which, since it was described and figured, had undergone a most efficient "remake" in Mr. Bartlett's able hands.

The curly feathers of the head, were now much more apparent and better developed than shown even in the woodcut given with the original description, and formed standing ridges over each eye. The tail was not flat, as would appear from the figure (pl. xlii.), but "boat-shaped" as in some of the American Grakles (*Quiscalus*), *i. e.* with the median tail-feathers elevated above the lateral. The two middle tail-feathers were very peculiar in construction, being shorter by $\frac{3}{4}$ of an inch than the next pair, and having the inner webs twisted round over the outer, so as to show their under surfaces.

The following papers were read:—

1. On *Phylloscopus borealis* and its Occurrence in Norway. By Robert Collett, C.M.Z.S., Conservator of the Zoological Museum of the University of Christiania &c.

[Received Jan. 15, 1877.]

In the summer of 1876, when visiting for the third time during the last six years the province of Finmark, mainly with the object of studying fishes and marine invertebrata, I resolved on devoting a few days to excursions along the forest-clad slopes of the rivers that flow into the great Porsanger, Laxe, Tana, and Varanger fjords. Among the more southern of the vertebrate species occurring here in considerable numbers, I hoped to light upon forms not hitherto observed in those regions (the most northerly of our country), and further elucidate the question as to what influence their occurrence in different degrees of latitude exerts on their outward structure and general habits. These parts of Finmark having never before been visited by any naturalist, it struck me as not impossible that I might

[1] See P. Z. S. 1876, p. 664.

fall in with some of the eastern species that are found inhabiting the shores of the White Sea, but which hitherto have not been observed in Norway.

My surmise proved correct; for sooner than I had anticipated, on one of the first of my excursions on the Porsanger Fjord, in the beginning of July, I met with *Phylloscopus borealis* in several localities on the banks of the rivers emptying into that fjord.

On the 4th of July, when traversing (in company with my friend Mr. Landmark, Inspector of Salmon Fisheries, at that time engaged in investigating the rivers of that region) one of the extensive and comparatively luxuriant birch-forests on the slopes of one of those rivers, my attention was attracted by a song wholly unknown to me, and which I at once set down as that of one of the many species of eastern *Sylviidæ*.

I had soon secured two individuals, both male birds; and having at hand Meves's paper about his journey in Northern Russia, I immediately recognized them as belonging to the species described by Blasius, in "Naumannia" for 1858, as *Phylloscopus borealis*; and we saw and heard several others at the same place.

A few days later, when strolling along the banks of one of the other rivers, I again observed this species in several places, in a tract about ten English miles in extent, and again shot two, also males, but was not able on my comparatively rapid progress through this part of the country to obtain a female. Hereabouts we heard, I should think, ten individuals, all of them singing, and consequently all males. On the 21st of July I first succeeded in shooting a female, in the vicinity of the Pasvig-elv, South Varanger, about 200 English miles east of the locality where I first met with the bird.

In the last-mentioned locality I observed several pairs; but the season being so far advanced, many of the males had probably ceased singing; and the species doubtless occurred in more places than those where I observed it. My time on each occasion having been limited, I did not succeed in obtaining either the nests or eggs; the latter perhaps had been hatched previous to my arrival in Finmark, or, may be, were in process of incubation.

Phylloscopus borealis consequently occurs throughout a considerable portion of Finmark in most localities suitable to its habits; probably therefore not further north than 70° 20′. Its distribution in Norway extends from the rivers on the confines of Russia to the birch-woods in the vicinity of the Porsanger fjord, or directly east of the North Cape; and the distance from that fjord to Alten on the west coast being not more than 20 English miles, it will very probably be found to inhabit the luxuriant birch-forests clothing the banks of the Alten Elv.

Phylloscopus borealis affects exclusively the loftiest and most luxuriant birch-forests in the vicinity of rivers or lakes; and as it never occurred when the growth was sparse or stunted, I soon learned to tell from the appearance of the locality whether it was inhabited by the little songster. The soil in these birch-woods was always tolerably fertile, and the vegetation luxuriant, reaching, as a rule, up

to the knees; the most conspicuous plants were *Geranium sylvaticum*, *Chamænerion angustifolium*, *Melampyrum*, *Myrtillus nigra*, various species of *Gramineæ*, &c.

In such localities several pairs were often found breeding, not far apart; and sometimes I could hear two, and even more males singing simultaneously. As a rule, however, they were somewhat scattered.

It invariably shunned localities where the soil was wet and spongy, selecting, in the forests it affects, comparatively dry and elevated spots, which it inhabits in company with *Phylloscopus trochilus*, *Cyanecula suecica*, *Turdus iliacus*, *Fringilla montifringilla*, and *Linota linaria*, likewise *Parus cinctus* and *P. borealis*.

The song of the male birds rendered them more easy of detection than the females, which were probably just then sitting, or feeding the nestlings. Notwithstanding the season was far advanced, they sang frequently and for a considerable time together, not only in the middle of the day, but late in the evening and early in the morning; nay, on one occasion, I heard one singing in the middle of a rainy night (this individual was one of those preserved.)

The song in summer is consequently not confined to any particular time of day. It consists of a but-one-syllable note, *zee, zee, zee, zee*, rapidly reiterated a dozen times in succession, the commencing strain bearing some resemblace to that of *Sylvia curruca* or *Emberiza citrinella*; then succeed one or two disconnected hissing sounds, *tseers, tseers*, a trifle lower in tone than the main song, but still audible at a considerably greater distance than the corresponding tones of *Phylloscopus collybita* (after its two-syllable song), which can only be distinguished in its immediate proximity.

The song is repeated several times, after which come intervals of greater or less duration when it is silent. The hissing sound was also uttered when the bird was frightened, and was the only note I heard from the female. The calling note (*hveet*) of *Ph. collybita* and *Ph. trochilus* was never uttered by *Ph. borealis*. Once only did I hear another and far lower song, which I at first mistook for that of *Parus cinctus*, and which bore a striking resemblance to the usual note of that species, the closing syllable being somewhat drawn out.

One I heard singing in this manner was shot and preserved; it was imitating, in all probability, the song of *Parus cinctus*, a habit characteristic of another of the singing birds of Finmark, *Acrocephalus schœnobœnus*.

As late as the 22nd of July the males were in full song in the vicinity of the Pasvig-Elv, South Varanger.

Though not, strictly speaking, shy, these birds exhibit, as a rule, greater wariness than *Ph. trochilus*, and if scared, would not always allow you to get within shot. They were remarkably brisk in their movements, scudding to and fro through the leafy tree-tops in pursuit of insects, and were rarely seen on the lower branches or in close proximity to the ground. They generally sing while fluttering from branch to branch, precisely as the other species of *Phylloscopus* do.

The localities they inhabit being exclusively such as swarm with mosquitos, and the summer of 1876 having been unusually pro-

ductive of those insects, my investigation of their general habits was rendered extremely difficult. It was absolutely impossible to keep still a moment, the veil not only affording insufficient protection against their continuous attacks, but being in other respects obstructive to minute observation.

The food, too, of *Ph. borealis*, at this season of the year, would seem to be wholly taken from these countless myriads; and the ventricles, in all the specimens examined were crammed with these insects. There are at least half a dozen species of these mosquitos, all more or less numerous, though some outnumber the others in particular localities.

On one occasion (July 22) I may have been close to a nest, on the Pasvig Elv, near Lake Tschoalme-javre, South Varanger. Both the parent birds exhibited unmistakable signs of alarm; but here, too, the mosquitos prevented me from finding the nest. A female shot in another locality on the same river had large incubation-spots.

I prepared in all 5 specimens, 4 of which were males. Both sexes were, in regard to colour of plumage, precisely alike. A very slight difference was seen in some of the males, the dorsal feathers being in some darker than in others, and the eye-stripe in such specimens was a trifle whiter.

They measured as follows:—

	Total length. millim.	Wing. millim.	Tail. millim.	Tarsus. millim.	Gape. millim.
♂.....	132	70	52	20½	15¼
♂.....	...	67	50		
♂.....	...	67	48½	20	15½
♂.....	135	71	50	20⅓	16
♀.....	123	63	44½	20	15

The female would thus appear to be somewhat smaller than the males, a deduction in accordance with Mr. Meves's measurements of a number of specimens obtained at Kopatjevskaja, south of Archangel, on the 8th and 9th of August, 1869 (Oefv. Kongl. Vet. Akad. Förh. 1871, p. 758), whereas, on the other hand, there was a singular and almost invariable discrepancy between the Russian and Finmark specimens, the latter appearing to have been all somewhat larger than those from Archangel. Middendorff has before observed that the back of specimens taken in the middle of the summer, when the plumage is somewhat worn and faded, has lost a little of its vivid green colour and has acquired a greyer tint; this was likewise the case with all the Finmark specimens, which, besides, scarcely retained a trace of the whitish yellow spots at the extremities of the wing-coverts that in autumn and early spring give to the wings a yellowish band. The first primary in one specimen was a trifle shorter than the coverts, in the others of the same length, or very little (1 millim.) longer.

The synonymy and general distribution of the species I shall refrain from dwelling upon here, my friend Mr. Dresser purposing, I understand, to treat upon that subject at large in his great work



J. Smit del. et lith.

M & N Hanhart imp.

PLECTROPTERUS NIGER

'A History of the Birds of Europe;' it appears, however, from the latest observations, that its distribution extends from the North Cape through the whole of Northern Russia and Siberia, and in an easterly direction as far as Russian North America. Those which annually make their appearance in the birch-woods of Finmark for the purpose of breeding take an easterly course, their passage to and from that locality being through Northern and Eastern Russia. This is the case too with several others of the smaller land birds of eastern origin that breed in Finmark—for instance *Anthus cervinus*, *Otocorys alpestris*, and *Plectrophanes lapponica*, which never, or at least very seldom, cross the southern parts of Norway on their passage; the same observation applies to the colonies of *Acrocephalus schœnobœnus* and *Cyanecula suecica*, which breed in Finmark, and perhaps to the majority of land birds of passage breeding in those regions.

It is highly probable therefore that *P. borealis* crosses Western Europe on its passage hither; and the specimens obtained on the island of Heligoland, which enabled Professor Blasius to correct the erroneous designation formerly given to this species, must therefore in all probability be regarded as the result of those occasional visits to Western Europe which are paid from time to time by East-European and North-Asiatic species.

2. Notice of an apparently new Species of Spur-winged Goose of the Genus *Plectropterus*. By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received February 5, 1877.]

(Plate VII.)

On former occasions[1] I have done my best to establish before the Society the distinctness of *Plectropterus rueppelli*, as I have proposed to name the bare-necked East-African form of the Spur-winged Goose, from the ordinary *P. gambensis*, which has a much wider range. Of both of these species we have at the present time specimens living in the Society's Gardens[2]; but we have also a pair of birds which, so far as I can judge from an examination of the living examples, clearly belong to a third species of this genus.

On June 6th of last year we received from Lieut.-General A. V. Cunyngham, Commandant of H.M. forces at Cape Town, two evidently adult birds of this genus, which appear to be quite distinct from either of the above-named forms. Their general appearance, as will be seen from the coloured drawing by Mr. Smit which I exhibit (Plate VII.), is rather that of *P. gambensis*, inasmuch as they have not the prominent frontal knob, nor bare spaces on the

[1] See P. Z. S. 1859, p. 131, and 1860, p. 38.

[2] Namely:—*Plectropterus gambensis* ♂, presented by C. B. Mosse, Esq., May 6, 1867; *Plectropterus gambensis* ♀, received in exchange, Aug. 13, 1868; and *Plectropterus rueppelli* ♂, presented by Mons. J. M. Cornély, C.M.Z.S., Sept. 28, 1876.

sides of the neck, which render *P. rueppelli* so easily distinguishable. But, in place of the conspicuous white throat and neck which are found in both of the previously known birds, the black colour of the belly is continued in *Plectropterus niger* (as I propose to designate the present form) up to the chin; and the white colour on the body in front is confined to a small space on the mesial line of the lower abdomen. The white of the back and scapulars in *P. niger* has also a greenish lustre pervading it which is not observable in the other species. This colour passes into a bronzy purple on the wings. The size is rather larger than that of our *P. gambensis*. The bill is bright red with the tip whitish, the iris black, the legs and feet of a duller red.

The two specimens received are believed to be both of the male sex; they are nearly alike, except that one individual has rather less white on the mesial line of the belly than the other.

In answer to my inquiries, General Cunyngham kindly informs me that he received these birds from Zanzibar; so that that part of the S.E. African coast is probably the true habitat of this species.

I will now say a few words as to the distinctness of the two other species of the genus (*P. gambensis* and *P. rueppelli*), which, though admitted, somewhat unwillingly, by Finsch and Hartlaub[1], is denied by Heuglin[2], the most recent authority on East-African ornithology. Here, in London, we know full well that the view that *P. rueppelli* is only the adult male of *P. gambensis* is quite untenable. We have had a male of *P. gambensis* in our Gardens ever since May 1867 which shows no symptoms whatever of acquiring the frontal knob and bare neck of *P. rueppelli*. In 1864, this bird paired with a female of the same species placed in company with it; and the female laid eggs, but did not hatch them out. Since then another female, received in 1868, has been placed in his company; so that we have at present what must be undoubtedly a fully adult pair of *P. gambensis*. I will ask any naturalist to compare these birds with the example of *P. rueppelli* (probably a male) obtained from the Antwerp Gardens, and most kindly presented to us last summer by M. J. M. Cornély, and to say whether it is possible to regard the species as otherwise than distinct.

What De Sousa's *Plectropterus sclateri* (Jorn. de Sc. de Lisboa, vol. ii. p. 157, 1860) may be, I cannot say. It has certainly nothing to do with the *P. niger* of our Gardens.

3. On the Mechanism of the Intervertebral Substance, and on some Effects of the Erect Position of Man. By A. H. Garrod, M.A., Prosector to the Society.

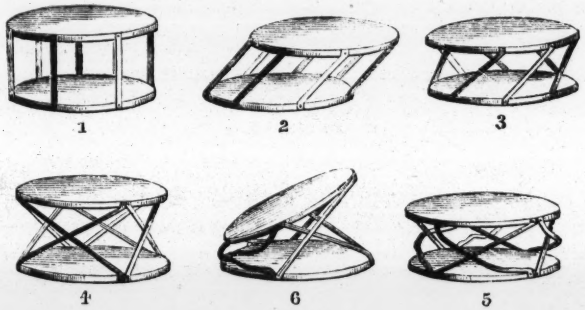
[Received January 17, 1877.]

In all works on human anatomy the structure of the disks of fibro-elastic tissue which intervene between the bodies of the verte-

[1] Vögel Ost-Afrika's, p. 801. [2] Ornithologie Nord-Ost-Afrika's, p. 1275.

bræ, are described as being composed of a central elastic cushion with a laminated fibrous investment, the individual fibres of which, instead of running straight from the lower edge of one vertebra to the upper edge of the one below it, are arranged obliquely, those of one layer crossing those of the next at a considerable angle. That this is an accurate statement of the condition which exists no one will doubt. Of its mechanical advantages, however, I have nowhere found any explanation.

If the fibres, instead of crossing had run parallel, and at right angles to the surfaces which they joined (fig. 1), it is evident that the median elastic pad would have efficiently retained the vertebræ at a distance from one another under ordinary circumstances. But in the act of jumping, for instance, when the feet have just reached



the ground, the momentum acquired by the head and upper extremities would compress the elastic pad, and diminish the distance between each two vertebræ. At this moment, if the upper part of the body had the least tendency to obliquity in its downward movement, the relaxed outer fibres of the intervertebral substance would allow the body of the upper vertebra to slide upon the one below it, (fig. 2), and so diminish the capacity of the spinal canal, as well as the general stability of the column. A forcible attempt to rotate the body upon the spine would, under similar conditions, be also attended by compression of the elastic pad, and considerable rotatory gliding of the vertebræ on one another (fig. 3).

These difficulties are entirely surmounted by the existing mechanism (fig. 4), as may be most satisfactorily demonstrated by the employment of a model composed of two circular disks of wood bound together, with an interval between them, by tapes of similar lengths arranged obliquely and crossing one another, attached to opposite points on the margins of the disks. So connected, no gliding of any kind of the disks upon one another can be produced, and the only movements possible are their approximation either at all points, or at any part where compression is employed (figs. 5 and 6).

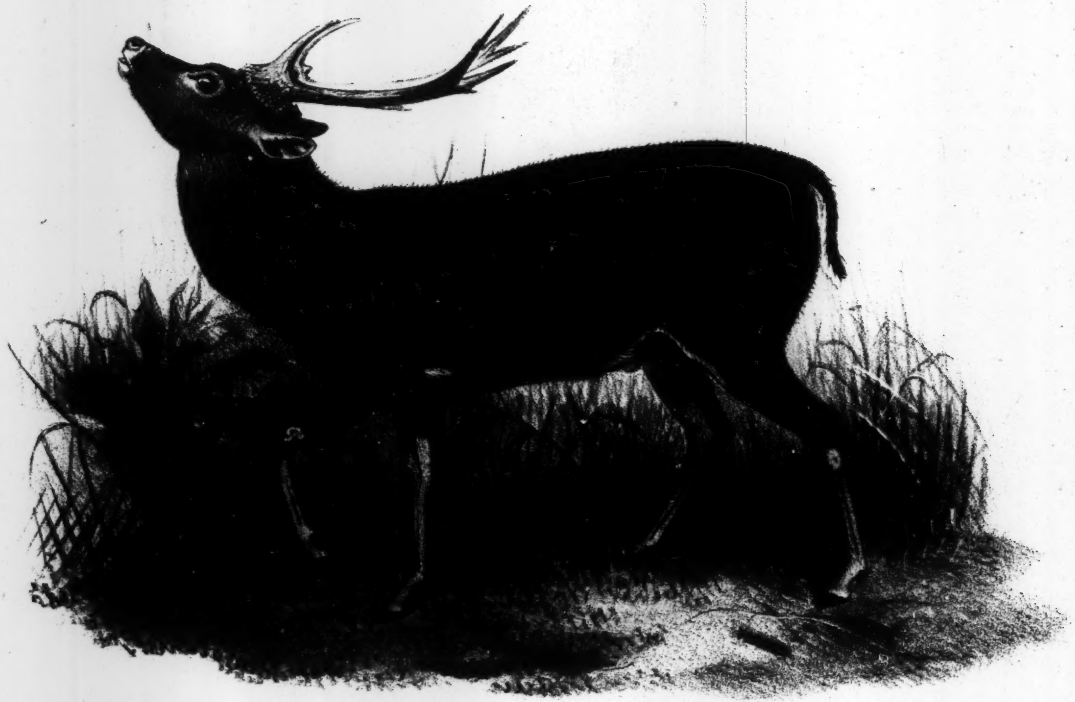
It may not be out of place for me here to draw attention to one or two points which are associated with the erectness of the carriage of man, in contradistinction to the horizontal and oblique attitudes assumed by lower animals.

The simple curve, concave ventrally, of the vertebral column of the higher Apes was most certainly shared by the human progenitor. In the young child it is found to exist. In its attempts to assume the upright carriage this progenitor must, equally certainly, have thrown the centre of gravity of its body directly above the hips, to do which it was necessary to bend the spine backwards. On account, however, of the thoracic region being rendered rigid by the attachment of its cage of ribs, and the sacrum being unmodifiable from its ankylosis, this flexion of the spine could only occur in the neck and loins; consequently the spinal flexures in man may be explained upon the assumption that the dorsal and sacral ventral concavities are the similar curves of the ancestral type, retained on account of the mechanical obstructions to their removal, whilst the ventral convexities of the yielding cervical and lumbar regions are the means by which the centre of gravity in the erect position is carried to a point directly above the hip-joints.

This assumption of a vertical attitude by a creature originally differentiated for a horizontal position of its body, has produced but marvellously slight inconvenience. If it had resulted in many, man could scarcely have survived. There are one or two, however, which are most clearly traceable to this cause, including the painful tendency to prolapse, antiflexion, and retroflexion of the uterus in women, as well as crural hernia in both sexes, and inguinal hernia in the male.

In mammalian animals with the body horizontal the weight of the uterus is transmitted to the abdominal walls, at the same time that the round and broad ligaments prevent it from leaving the pelvic region. In the Sloths and Bats these ligaments are still more called into play, on account of the peculiar attitudes assumed by them. No more satisfactory mechanism could be desired. But in the human species the condition is very different. The uterus is situated almost directly above the vagina; and the entire absence of any ligaments to suspend it, place it in a position of the greatest mechanical disadvantage, especially when congested and depressed by stays. Unsupported, it frequently bends forward or backwards, or even drops into the cavity of the vagina, and there finding nothing to obstruct it, becomes completely prolapsed. Similarly in inguinal hernia, the abdominal walls being abnormally extended in connexion with the lumbar curve, the tendency to rupture in the region of the inguinal canal must be greatly increased, as it must likewise be by the downward tendency of the viscera.

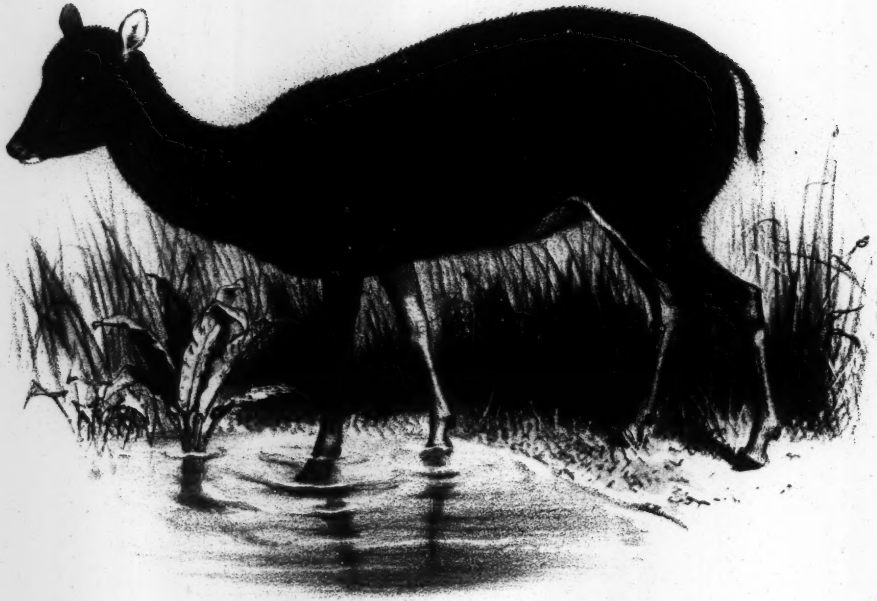
P.Z.S. 1877 Pl. .



J.Wolf del. J.Smit lith.

M.& N. Hanhart imp.


J.Wolf del. J.Arnz lith.
M & N Hanhart imp.





4. On the Deer of the Philippine Islands, with the Description of a new Species. By Sir Victor Brooke, Bart., F.Z.S.

[Received January 22, 1877.]

(Plates VIII.–X.)

With perhaps the exception of the Simple-horned Deer of South America comprising the subgenus *Coassus*, there is no group of existing Cervidæ concerning which our knowledge is so inexact and so fragmentary as that relating to the small Rusine Deer of the Philippine Islands. With the desire of remedying this defect as far as possible, I have for some years paid particular attention to the subject, and during several visits to Continental Museums have enjoyed (thanks to the great courtesy of their conservators) ample opportunities of studying the materials bearing upon it which they contain.

I regret that the result of my investigations is not more satisfactory; and it is solely in the hope that an exposure of the nakedness of the land may attract the attention of future naturalists travelling in the Philippines to the subject that I venture to lay the following notes before the Society.

Cervus philippinus. (Plate VIII.)

1820. *Cerf des Philippines*, Desm. Mamm. p. 442, note 1.
1821–24. —— ——, Cuv. Oss. Foss. (ed. ii.) vol. iv. p. 46.
1827. *Cervus philippinus*, Ham. Sm. Griff. An. Kingd. vol. iv. p. 147, vol. v. p. 33.
1844. —— ——, Sund. Pec. in Kongl. Vet. Handl. 1844, p. 179.
1855. —— ——, Puch. Rev. et Mag. Zool. 2nd ser. tom. vii. p. 49.
1857. —— ——, Puch. Rev. et Mag. Zool. tom. ix. p. 481, pl. 15.
1866. *Cervus mariannus*, Fras. P. Z. S. 1866, p. 367.

Description.—Adult male. Hair of moderate length and rather harsh. General colour rich ruddy brown, darkest on the back and lightest on the neck. Forehead and cheeks rufous fawn-colour; dark (almost black) streaks commence over each eye, and, blending together, form a band running down the centre of the face, which is separated from the dark moustache-like mark bordering the muzzle by a narrow track of pale fawn-colour. Breast and belly uniform brown. Tarsal gland plainly marked by a rufous spot. Ears of moderate size, covered externally by short close-set hair. Horns remarkably rough and massive; a powerful long brow-antler, and one short tine directed inwards. Height at shoulder about 27″.

Skull. Total length 11·3. Anteorbital fossa very deep, suddenly pressed in anteriorly to the orbit, and occupying the entire facial plate of the malar. Facial portion of skull compressed laterally, and deeply from above downwards.

The skull of this species is an exact miniature of that of *Cervus aristotelis*.

Skeleton. Fourteen pairs of ribs. Cervical vertebræ remarkably large.

Female. In external coloration differs in no way from the male.

Young. Of a uniform brown without spots.

Hab. Island of Luzon, Philippines.

The Philippine Deer is a very stout-built, short-limbed, powerful animal, in carriage and general appearance closely resembling the common Sambur (*Cervus aristotelis*).

Literary History.

1820. M. Dussumier obtained a young male in Luzon which he sent to Paris; the animal died *en route*. Desmarest gives a short notice of the arrival of this specimen in Paris (Mamm. p. 442, note 1), where the specimen is still preserved in the Musée d'Histoire Naturelle (No. 409 in the Catalogue of the Museum).

1827. Hamilton Smith, in Griffith's 'Animal Kingdom' (*vide suprà*), describes this specimen and names it *Cervus philippinus*. He considered the species allied to the Muntjacs.

1836–37. In the stores of the Musée d'Histoire Naturelle at Paris there are several skins undoubtedly referable to *Cervus philippinus*. These specimens were obtained during the voyage of the 'Bonite.' Eydoux and Souleyet, while they describe and figure their indefinite species, *Cervus pseudaxis* (Voy. de la Bonité, vol. i. p. 64, pl. 12), are entirely silent respecting the Philippine Deer, of which species they had collected such ample materials.

1844. Prof. Sundevall (*vide suprà*) places the species amongst the Rusine Deer. He points out for the first time the absence of hair on the posterior surface of the metatarsal phalanges.

1851. Capt. Diguet presented a male and female of this species to the French Academy of Sciences. The specimens had been obtained at Manilla.

1855. The female obtained by Capt. Diguet having died in the previous year, Pucheran, in the 'Revue et Magasin de Zoologie' (*vide suprà*), published a very careful and detailed description of the specimen, which he correctly refers to *Cervus philippinus*.

1857. Capt. Diguet's male having died in 1856, Pucheran continued his observations on the species (*vide suprà*), which he considered to differ decidedly from *Cervus mariannus*.

1866. Mr. Louis Fraser exhibited and figured (P. Z. S. 1866, p. 367) the horns of a Deer killed near the village of Bosa-Bosa, in Luzon. These horns, as far as it is possible to judge from a drawing, appear in no way to differ from those of *Cervus philippinus*. I therefore think Mr. Fraser was premature in his decision that they were referable to *Cervus mariannus*.

1875. Some years ago I observed a Deer in the Zoological Gardens at Berlin which appeared to me irreconcilable with any species with which I was acquainted. Upon mentioning my difficulty to Mr. Sclater he considered the matter worthy of attention, and succeeded

last year in effecting the transfer of the specimen from Rotterdam to the Society's Menagerie, where it is still living and in perfect health (Plate VIII.). An attentive examination of the animal since its arrival in London has convinced me that it is safely referable to *Cervus philippinus*, and that the richness of coloration, in which alone it differs from the Continental specimens of that species, is owing to the deterioration which these latter have suffered during the many years of exposure to light to which they have been unavoidably submitted. The dark facial markings so strongly shown in the living animal are either very faintly visible or absent in the stuffed specimens; but in one of the flat skins, from the voyage of the Bonite, in the Paris Museum, these dark markings are very distinct. The antlers carried by the animal at the time Mr. Wolf's drawing was made were slightly abnormal, as is so frequently the case with deer in confinement. The woodcut published in the Society's 'Proceedings,' 1866, p. 367, shows faithfully their normal form.

List of specimens examined.

Paris.

a. ♂ jun., type. Mounted specimen and skeleton.
b. ♂ adult. (Diguet's specimen). Ditto. ditto.
c. ♀ adult. (Diguet's specimen). Ditto.
d, e. ♀ ♀ adult. et jun. Ditto.

Leyden.

f, g. ♂ ♂ adult. and jun. Mounted specimens.

Berlin.

h. ♂ adult. Mounted specimens.

London.

i. ♂ adult. Living in Society's Managerie.

CERVUS MARIANNUS.

1820. *Cervus mariannus*, Desm. Mamm. sp. 669, p. 436.
1821–24. —— ——, Cuv. Oss. Foss. (ed. 2), vol. iv. p. 45.
1824. *Cerf des Mariannes*, Quoy & Gaim. Voy. de l'Uranie, Zool. p. 32.
1827. *Cervus mariannus*, Ham. Sm. Griff. An. Kingd. vol. iv. p. 115, and vol. v. p. 311.
1844. —— ——, Sund. Pec. in Kong. Vet. Handl. p. 179.

Although, as I shall presently show, I have but little doubt that *Cervus mariannus*, Desm., and *Cervus philippinus*, Ham. Smith, are specifically identical, I have considered it expedient for the present to leave the question open and to keep the references to their literary history separate.

The attention of future collectors in the Philippine and Marianne Islands will thereby be better aroused to the appreciation of one of the several desiderata, which can only yield to their zeal and energy.

Literary History.

1817–1820. During the voyage of the 'Uranie' round the world, specimens were obtained of a small deer, which is stated by Quoy

and Gaimard, the naturalists of the expedition (Zool. Voy. de l'Uranie, p. 33, 1824), to have existed in immense numbers on Guam, the largest of the Marianne Islands. They thus write respecting this animal :—

"Une petite espèce de cerf axis, qui a été apportée des Philippines, a tellement multiplié, que l'on ne connoît pas de lieu qui en contienne proportionnellement davantage ; car il existe à Guam plus de mille de ces animaux. On nourrit de leur chair les équipages des navires qui touchent à cette île, et le nôtre n'eut presque pas d'autres vivres pendant le temps que nous y demeurâmes. . . . Le faon est fauve, et n'a point de taches comme celui d'Europe, à quelque âge qu'on le prenne."

They describe the island of Guam thus :—"Cette île n'a que quarante lieues de tour. Son sol est élevé, montueux, en partie volcanique et en partie formé de calcaire madréporique. Les montagnes, qui ont toutes suivi l'action de feu, sont arides et peu boisées. . . . . Cet archipel n'a qu'un mammifère qui ne lui ait pas été apporté."

1820. In his 'Mammalogie' (p. 436), Desmarest confers the name *Cervus mariannus* upon the species observed by Quoy and Gaimard in the island of Guam. In his short notice Desmarest only mentions two specimens, a stuffed male and a fawn.

1821–24. In the second edition of his 'Ossemens Fossiles' (p. 45), Cuvier mentions, in addition to the types of Desmarest's description, the skull of a male, also brought from Guam by Quoy and Gaimard. Cuvier says that he was "presque tenté de rapporter à cette espèce, à cause de la forme très-semblable du crâne, un individu jeune rapporté de Manille par M. Dussumier" (= the specimen upon which Hamilton Smith subsequently established his species *Cervus philippinus*). The absence of canines in the specimens from the Marianne, and their presence in the Philippine specimen, induced Cuvier, however, to suspend his judgment in the matter. He particularly remarks with regard to the skull obtained by Quoy and Gaimard, "le frontal est relevé longitudinalement entre les cornes, et a en avant des orbites, vers la base du nez, deux convexités longitudinales fort remarquables."

1827. Hamilton Smith in Griffith's 'Animal Kingdom' figures the stuffed male above mentioned, and describes it and the fawn, retaining for them Desmarest's name *Cervus mariannus*.

Observations.

In the Musée d'Histoire Naturelle at Paris there is still preserved the fawn (414 A in Cat.) which formed one of the types of Desmarest's original description. The adult male, which all authors describe as having been in an exceedingly bad state of preservation, is no longer contained in this museum ; but in the Musée d'Anatomie I have observed a skull which I believe to have belonged to this specimen (No. 1345 in Cat.). The close resemblance of the horns in this specimen to Hamilton Smith's plate, and the occipital bones

having been sawn through in the manner adopted by taxidermists, leave but little doubt in my mind as to the correctness of this opinion. Another skull in the Musée d'Anatomie (No. 1559 in Cat.) is, I think, the second skull mentioned by Cuvier. In addition to these skulls, there are in the same museum three skulls collected by Hombron and Jacquinot in Guam.

In these five skulls in the Musée d'Anatomie, and in the immature stuffed specimen in the Musée d'Histoire Naturelle at Paris consists as far as I have been able to ascertain, the entire well-authenticated material referable to the deer of the Marianne Islands which is contained at this present moment in European museums. Compared with the skull of the male obtained by Diguet in Luzon (the only authenticated skull of an adult *Cervus philippinus* which I have as yet discovered), the skulls of the deer of the Marianne Islands present in my opinion no characters in common in which they differ from the Luzon specimen. Each of the five skulls exhibits remarkable individual peculiarity, the difference between the two most dissimilar being greater than that existing between some of the skulls and that of Diguet's specimen. Similar individual cranial peculiarities are shown in a large series of skulls of *Cervus aristotelis* collected on the Neilgherry Hills, in Southern India, in my own collection.

The great convexity at the junction of the frontals and nasals mentioned by Cuvier and Pucheran, and considered as of specific value by the latter, is shown in great excess by one of the Marianne skulls, less decidedly by another, and scarcely, if at all, by any of the remaining three.

The presence or absence of canines is, as has been shown by Pucheran in the case of both the Marianne and the Luzon Deer, dependent more or less on the age of the animal, these teeth being generally lost shortly after the animal attains full maturity.

As regards Quoy and Gaimard's immature specimen, it resembles in every important particular a specimen (♀ of list, p. 53) of similar age bred in the Jardin des Plantes from the specimens collected by Diguet in Luzon.

The evidence therefore lies, I think, clearly in favour of the opinion that the deer of the Marianne Islands was originally imported from Luzon; but in the present state of our knowledge respecting this group of deer I think it would be premature to express a decided opinion upon the subject. It is fully possible that it was from some other part of the Philippines that the Mariannes were stocked with deer, and that the Philippines possess, in addition to such comparatively widely distinct species as *Cervus philippinus* and *Cervus alfredi*, representative species, for which, notwithstanding their lesser degree of specific distinction, zoologists may find it necessary to retain distinctive titles.

The following Table contains the measurements of a skull and horns preserved in the British Museum (655 *b* in Cat.). No history is attached to this specimen, which has been for many years in the collection. It bears a striking resemblance to that described by



Left horn of *Cervus mariannus*. Specimen in the British Museum. *a*, side view; *b*, front view.

Cuvier as having "en avant des orbites deux convexités fort remarquable." The left horn of this skull is represented in the drawing now exhibited.

	inches.	metre.
Total length of skull in straight line	11·8	0·300
Distance from point of præmaxilla to point of nasals	1·7	0·042
Length of præmaxillæ	2·6	0·065
„ nasals	3·8	0·095
From anterior rim of orbit to free extremity of præmaxilla	6·2	0·155
From upper extremity of nasals to fronto-parietal suture	5	0·125
Across maxilla 1″ anterior to orbit	3·6	0·090
„ 2″ „ „	3·3	0·083

	inches.	metre.
Extent of upper premolars	1·6	0·040
„ „ molars	2	0·050
„ lower premolars	1·1	0·027
„ „ molars	2·3	0·058
Length of horns	18	0·455
„ brow-antler	10	0·253
Circumference of burr	7·5	0·190
„ „ beam	5	0·125

CERVUS NIGRICANS, sp. nov. (Plates IX. & X.)

1870. *Cervus mariannus*? Sclat. P. Z. S. 1870, p. 279.

Adult female.—External characters. Hair of moderate length, rather coarse. General colour blackish brown, slightly tinged with rufous. Entire face, upper parts of the neck, and shoulders almost black. Limbs from the carpal and tarsal joints downwards bluish grey-brown. Belly rufous brown. Under lip and inside of thighs white. Tarsal gland plainly marked by a spot of yellowish white hair. Ears oval, decidedly small, almost quite naked externally. Muzzle coriaceous, ample, its upper border running directly across from the upper angles of the nares, which it completely surrounds inferiorly.

Skull (Plate X.).—*General form.* Portions of the frontals and parietals forming the roof of the cranial cavity boldly convex, both in a lateral and antero-posterior direction; facial portion rather short, depressed and much widened laterally as far as the anterior premolar, from which point forwards the facial portion of the skull is reduced in a marked manner both in width and length.

Anteorbital fossa of moderate depth, situated in the anterior portion of the facial plate of the lacrymal.

Anteorbital vacuity of moderate dimensions. Malar divided by a longitudinal suture[1] into two subequal parts (Plate X. *a*). Præmaxillæ remarkably small, their greatest length very little exceeding that of the upper molar series. Occipital condyles large. Auditory bullæ small, their external surface irregular, with a long pointed laterally compressed styloid process. A large depression for the tympanohyal, which is not completely enclosed by the definite vaginal process which depends from the floor of the prolonged external auditory meatus.

Squamous portion of the squamosal remarkably low.

Teeth very large; the diameter of each of the upper molars in a transverse direction exceeds its longitudinal diameter. Upper and under molars with very small cylindrical supplementary columns. Canines absent.

Skeleton.—14 pairs of ribs.

	inches.	metre.
Height at the shoulder	24	0·610
Length from point of shoulder to ischium	27	0·685

[1] It is possible that this suture is an individual and not a specific character.

	inches.	metre.
Length of ear, inside[1]	3·2	0·080
Breadth of ear	1·9	0·048
Length of tail exclusive of hair	3	0·075
Total length of skull in straight line	9	0·230
Distance from point of præmaxillæ to point of nasals	1·4	0·035
Length of præmaxillæ	1·8	0·045
Length of nasals	2·5	0·064
From anterior rim of orbit to free extremity of præmaxillæ	4·6	0·115
From upper extremity of nasals to fronto-parietal suture	3·2	0·081
Across maxillæ 1″ anterior to orbit (Pl. X. *b b′*)	3·2	0·081
Across maxillæ 2″ anterior to orbit (Pl. X. *c c′*)	2·4	0·060
Extent of upper premolars	1·7	0·043
Extent of upper molars	1·7	0·043
Extent of lower premolars	1·3	0·033
Extent of lower molars	1·9	0·048
Length of humerus	6·6	0·168
„ ulna	7·3	0·185
„ radius	5·5	0·140
„ metacarpal cannon bone	4·7	0·120
„ femur	7·8	0·195
„ tibia	8·2	0·205
„ metatarsal cannon bone	5·6	0·140

Hab. Philippines (exact island ?).

Comparison with allied species.

Cervus nigricans in its general external form, crouching Agouti-like carriage, short naked ears, flattened and wide face, more closely resembles *C. alfredi* than any known species. In its lighter build and uniform dark brown colour it is easily distinguished from *C. alfredi*, which it is spotted at all ages.

From *C. philippinus* the new species differs in the form of the face, which in *C. philippinus* is laterally compressed and deep from above downwards. The length of the præmaxillæ and the width across the maxillæ anterior to the orbits (Plate X. *b b′*, *c c′*) bear a very different relative proportion to the cranial measurements in the two species. In *C. philippinus* the ears are of fair proportional size and externally covered with hair. The colour of the new species is much darker than that of *C. philippinus*.

It may be useful to mention here that *C. porcinus* differs from all the typical Rusine deer in the possession of large inflated auditory bullæ, and that *C. aristoteles* and its representative species *C. equinus* (Malacca, Borneo), *C. swinhoii* (Formosa), *C. philippinus* (Luzon), and (?) *C. alfredi* and *C. nigricans* differ from *C. hippelaphus* (Java)

[1] This measurement is taken across the concavity of the ear-conch, and does not include that portion of the external ear situated inferior to the opening.

and its representative species *C. moluccensis* (Celebes) and *C. peronii* (Timor) in the former having the outer, the latter the inner tine of the terminal fork the longest. Exceptions to this rule are not unfrequently to be found in finely developed antlers of *C. aristotelis*; but in specimens of the horns of immature stags of all species the outer line is invariably the longest or most massive.

Observations.

In the Museum of Leyden there is a deer preserved which is, I think, decidedly referable to the male of this species. Professor Schlegel was unable to give me any exact information respecting the specimen. In its dark colour, very short and naked ears, and general form it exactly resembles the female above described, and contrasts strongly with the fine male *Cervus philippinus* in the same Museum. The horns closely resemble those of *Cervus philippinus*; they possess a stout brow-antler and one short tine directed inwards.

The female from which the figure (Plate IX.) and above description were taken, was received by the Society from the Philippines in 1870, no more exact locality being given, and was noticed by Mr. Sclater in the 'Proceedings' for that year, p. 279. Mr. Sclater referred the species with doubt to *Cervus mariannus*. Upon its death, which took place about a year ago, the specimen passed into my private collection, where it is at present preserved. A male hybrid was produced between this animal and the male *Cervus alfredi*. In external appearance the young animal resembled the mother more than the father, being, so far as I can recollect, very indistinctly spotted, and of a very dark brown.

CERVUS ALFREDI.

1870. *Cervus alfredi*, Sclat. P. Z. S. 1870, p. 381, pl. xxviii.
1871. —— ——, Sclat. P. Z. S. 1871, p. 478.
1872. —— ——, Sclat. P. Z. S. 1872, p. 24.

Adult male. Hair soft, of moderate length. General colour rich dark brown, with here and there a slight ruddy tint; cheeks and occiput pale brown; lower jaw and throat dirty white. Neck and shoulders anteriorly uniform dark brown. Posterior parts of shoulders, back, and sides distinctly marked at all seasons of the year by yellowish white spots. Breast and belly yellowish white. Limbs externally, above the carpal and tarsal joints, uniform brown, internally dirty white; below the carpal and tarsal joints, pale brown. Ears and tail short, the former almost naked externally.

Horns not greatly exceeding the head in length, a short brow-antler, and very short tine directed inwards.

Height at the shoulder about 25″.

Adult female. In coloration resembles the male.

Young. Spotted from the time of their birth.

Hab. Philippines (Luzon?).

Observations.

Mr. Sclater originally described this well-marked and interesting

species from a male presented to H.R.H. the Duke of Edinburgh by a Spanish gentleman at Manilla; and in the following year the Society received in exchange a female of the same species which was said to have come from the Philippines. The exact island inhabited by this species remains, however, an open question. The skin and skeleton of the type of the species are preserved in the British Museum (76. 2. 30. and 1681 *a*); unfortunately the bones are in such bad condition that I have found it impossible to form a clear idea of the cranial characters; but, so far as it is possible to judge from this single specimen, the skull of *Cervus alfredi* resembles that of *Cervus nigricans* much more closely than it does that of *Cervus philippinus*.

Specimens examined.

a. ♂ adult., type. Brit. Mus.
b. ♂ jun. Zool. Soc. Menagerie.
c. ♀ adult. Zool. Soc. Menagerie.

5. Description of twelve new Species and a new Genus of *Rhopalocera* from Central America. By F. DuCane Godman and Osbert Salvin.

[Received January 26, 1877.]

The following species of Butterflies appear to us to be undescribed. Figures of all of them have been prepared, and will be published at a future time in a work on which we are now engaged. In the mean time we issue these preliminary descriptions to enable us to inscribe the proper names on our Plates.

Danainæ.

1. Eutresis theope.

♂. Exp. 3·7 in. Closely allied to *E. hyperia* (Dbd. and Hew. Gen. Diurn. Lep. i. p. 112, Suppl. plate, f. 2), but differing from that species in the general tint of the orange red of the wings being duller, in having the whole of the central portion of the posterior wings semi-transparent; the dark markings of the central portion of the anterior wings are more restricted, and the dark margin of the hind wings much narrower.

Hab. Costa Rica. Mus. nostr. et H. Druce.

2. Napeogenes hemimelæna.

♀. Exp. 2·3 in. Allied to *N. peridia*, Hew. (Ex. B. i. Ith. 4, f. 20), but differing in having the two middle of the four bands of yellow spots of the anterior wings blended into one large spot, and another smaller one lying between the second and third median branches. On the hind wings the large yellow apical patch of *N. peridea* is reduced to two minute spots, and the marginal row of yellow spots is much smaller than in that species.

Hab. Panama, Lion-Hill Station. Mus. nostr.

Besides the single specimen in our collection we have only seen one other, a male, in that of Dr. Staudinger of Dresden.

3. Ithomia alcmena.

♀. Exp. 2·1 in. Allied to *I. artena*, Hew. (Ex. Butt. Ith. viii. f. 48), and having the same neuration of the hind wing as the female of that species, differing, however, in coloration, the dark margins of the wings being much broader and blacker; the black quadrate spot covering the base of the cell is placed at a more obtuse angle to the costa, the extracellular white spot following the same angle as the black one; near the distal ends of the median and radial interspaces are obsolete white spots not seen in *I. artena*, but not infrequent in other *Ithomiæ*. The borders of the wings beneath are deep rufous; and at the apical angle of all are minute white spots.

Hab. Guatemala; Choctum in Northern Vera Paz. Mus. nostr.

4. Ithomia pusio.

♂. Exp. 1·7 in. Allied to *I. lyra*, Salv., and *I. andronica*, Hew., differing from the latter in the apex of the anterior wings having only a narrow black border, inside of which up to the extracellular white spot on the wing is diaphanous. In *I. andronica* white spots are enclosed in the dark apex of the wing. As in *I. andronica*, the dark spot covering the base of the cell is triangular and not subrectangular as in *I. lyra*. The ♀ (exp. 1·85) resembles the male in colour, differing in the sexual divergence of the neuration usual in the *Hymenitis* section of *Ithomia*.

Hab. Nicaragua, Chontales (*Belt* and *Janson*). Mus. nostr.

We have long hesitated to describe this *Ithomia*, owing to its similarity to *I. andronica*; but having now seen a large number of specimens we consider its distinctness sufficiently apparent.

5. Ithomia zygia.

♂. Exp. 2·7 in. Anterior wings semitransparent dark brown; costa, outer and inner margins, a spot in middle of the cell, another at the extremity, and the median and discoidal branches black; a large spot near the end of the cell and two curved bands of spots crossing the apical half of the wing, the outermost following the curve of the margin, semitransparent yellow; two small white spots near the apex; posterior wings semitransparent, fulvous, yellower in the cell, and towards the apex a broad black margin enclosing three white spots, that at the apex being the smallest; underside as above, the white marginal spots being more conspicuous. Female similar to the male as to the position of the markings, but darker, the white spots on the marginal border of the hind wings larger, central portion of hind wings, and middle of inner margin of fore wings, rich tawny.

Hab. Chiriqui. Mus. nostr. et H. Druce. Allied to *I. gonussa*, Hew.

Satyrinæ.

6. Pierella incanescens.

♂. Exp. 2·8; ♀ 3·15. Allied to *P. helvina*, Hew. (Ex. Butt. Het. t. 1. f. 4), the colours being similarly distributed. The black

transverse markings of the wings are all less distinct; and that crossing both wings beyond the end of the cell of each in the present species passes in the hind wing considerably beyond the end of the cell. The ocelli near the apical angle of the hind wings are larger, and the red colour of the same is more extended, leaving only a comparatively narrow black border. From *P. ocreata*, Salv. and Godm. (Ann. Nat. Hist. ser. 4, vol. ii. p. 143), the present insect differs in the absence of the conspicuous white markings of the hind wings, as well as in the position of the bands common to both wings, and other minor characters.

Hab. Nicaragua, Chontales (*Belt, Janson*); Costa Rica (*Van Patten, Endres*); Chiriqui and Veragua (*Arcé*); Panama, Chepo (*Arcé*). Mus. nostr.

7. OXEOSCHISTUS GIGAS.

♀. Exp. 3·5 in. Outer margin of both wings dentated somewhat as in the genus *Dædalma*. Apex of anterior wings truncate, outer margin concave, the upper radial elongated and carrying a well-defined emargination. Above brown; anterior wings with a submarginal row of five white spots, and two other spots, one between the median branches, the other between the first median branch and the submedian nervure; posterior wings with a broad tawny margin intersected by the dark nervules, and having a black spot about the middle of the median interspace. Beneath, anterior wings as above, with the apex tinged with tawny, and irregularly marked with whitish spots; hind wings deep tawny; a row of ocelli between the median and radial nervules, that between the median branches largest and bipupillated, two ocelli between the submedian nervure and the first median branch; a number of irregularly-shaped silvery spots in the vicinity of the ocelli, and four similar ones arranged across the middle of the cell from the costa to the submedian nervure; an indistinct pale submarginal band between the ocelli and the outer margin.

Hab. Guatemala, Aceytuno. Mus. nostr.

HELICONINÆ.

8. HELICONIUS FASCIATUS.

♂. Exp. 3·5 in. Closely allied to *H. ismenius*, Latr. (Humb. and Bonpl. Obs. Zool. ii. p. 125, t. 41. f. 5, 6), which it appears to replace on the Isthmus of Panama. The black spot in the middle of the cell unites with the black apical portion of the anterior wing; and the posterior wings are crossed by a well-defined band extending from the apex to the inner margin.

Hab. Isthmus of Panama (*M'Leannan*). Mus. nostr.

NYMPHALINÆ.

BOLBONEURA, gen. nov.

Anterior wings short, costa rounded, outer margins with a slight emargination. Posterior wings rounded, anal angle not produced. Palpi

long, projecting far beyond the head, as in the genus *Nica*. Costal and median nervures of the anterior wing swollen towards their bases, almost as in the costal nervure of the genus *Cystineura*. General coloration as in the genus *Epiphile*.

Type *Temenis sylphis*, Bates (Ent. Monthl. Mag. i. p. 113).

Hab. Mexico and Guatemala. Mus. nostr.

9. EUBAGIS IMMARGINATA.

♂. Exp. 1·7 in. Above uniform *Eubagis* green; the anterior wings without black spots or dark outer margin; posterior wings with a black margin, and a single black spot in the interspace of the median branches. Beneath, the markings almost exactly correspond to those of *E. postverta* (Cr.), the colour between the ocelli of the posterior wings being darker than in the above species.

Hab. Nicaragua, Chontales (*Belt*, *Janson*). Mus. nostr.

10. EUNICA MIRA.

♀. Exp. 2·45 in. Anterior wings with the apex pointed, the costa and outer margin uniformly convex; margin of the hind wings rounded. Anterior wings deep purple black, with a greenish tinge, beyond the cell an interrupted band of paler greenish hue crosses the wing from the costa to inner angle, outside of which is a band of whitish passing from the costa to the middle of the outer margin; posterior wings deep brown, outer margin pale; dark submarginal spots near the apical angle. Beneath, both wings distinctly variegated with black spots and bands on a blue-green ground, apex of the anterior wings and margin of the posterior wings whitish, the former crossed by a line of black spots; the posterior wings have a line of fulvous spread over the region of the median nervure, the inner margin being of the same colour.

Hab. Veragua (*Arcé*). Mus. nostr.

This remarkable species, of which at present we have only received one damaged female specimen, belongs to the group containing *Eunica sophronisba* (Cr.), but is abundantly distinct from that species, both in the coloration and the pointed apex of the anterior wings. The male remains to be discovered.

11. EUNICA EXCELSA.

♂ Exp. 2·95 in. Similar to *E. cinara*, Hew. (Ex. Butt. *Cybd.* t. i. f. 2), as to the markings of the undersurface; but above, instead of the smalt-blue of both wings being of a uniform tint, the hind wings are suffused towards their outer margin with glittering greenish blue, as in *E. venusia*, Feld. (Voy. Nov., Lep. p. 407, t. 52. f. 3), and *E. aspasia*, Feld. (Wien. ent. Monat. v. p. 104). From the last-named species it differs in the greater extent of the smalt-blue of the anterior wings and in the paler ground-colour of the posterior wings beneath; the glistening blue of the latter wings above is also greener and more refulgent.

Hab. Chiriqui (*Arcé*). Mus. nostr.

12. EUNICA CÆRULA.

♂. Exp. 2·4 in. Allied to *E. tatila*, H.-Sch. (Aussereurop. Schm. f. 69–72), ex Haiti, but differing in the greater extent and more purple tinge of the blue of the wings, which in Haitian specimens (agreeing fairly with H.-Schäffer's plate) is of a paler tint. Beneath, the posterior wings are deeper brown, and the markings much less distinctly defined.

Hab. Guatemala. Mus. nostr.

6. Account of the Zoological Collection made during the visit of H.M.S. 'Peterel' to the Galapagos Islands. Communicated by Dr. ALBERT GÜNTHER, F.R.S., V.P.Z.S., Keeper of the Zoological Department, British Museum.

[Received January 29, 1877.]

(Plates XI.–XIII.)

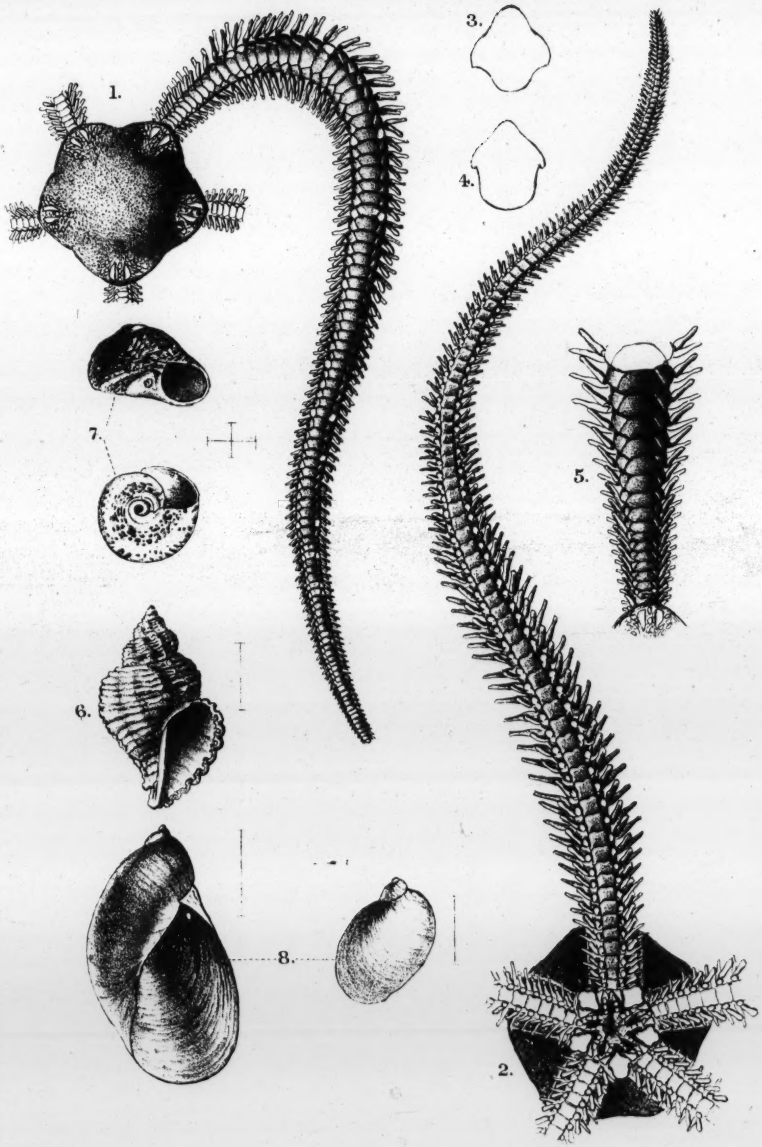
The circumstances under which the zoological collection[1] described in this paper was obtained are, shortly, the following. By direction of Rear-Admiral the Hon. A. A. Cochrane, who then commanded the Pacific Station, Commander W. E. Cookson proceeded in H.M.S. 'Peterel,' in June 1875, for a short cruise in the Galapagos archipelago. His whole stay was limited to a fortnight, in which time he landed on Charles and Abingdon Islands, and at Tagus and Iguana Coves in the Albemarle Islands. These, at least, were the localities where Commander Cookson, assisted by Staff-Surgeon Bett, collected the zoological objects which, by direction of Admiral Cochrane, have been deposited in the British Museum.

Valuable as this contribution to our knowledge of the Galapagos fauna is, it serves at the same time to show how incomplete is our acquaintance with one of the zoologically most interesting stations. But for Commander Cookson's timely visit, the Abingdon Tortoise would, in all probability, have disappeared, unknown as if it had never existed, or leaving only some fragments of its osseous frame. Perhaps we may hope that the success which attended Commander Cookson's search may encourage others to complete the work commenced by Fitzroy and Darwin.

For the convenience of the student of this fauna, it seemed desirable to keep together in a connected form the notices of the various parts of the collection which have been examined and determined by the staff of the Zoological Department.

My thanks are due to Mr. McLachlan, F.L.S., for the notice of the Libellulæ.

[1] Referred to at meetings of the Zoological Society last year; see P. Z. S. 1876, pp. 178, 422, 520.



E.A.Smith del.

Mintern Bros. imp.

1–5, OPHIONEREIS ALBOMACULATA. 6, RHIZOCHILUS PARVUS.
7, TROCHUS COOKSONI, 8, SUCCINEA BETTII.





2ª



2ᵇ



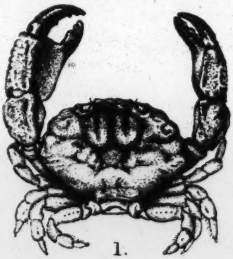
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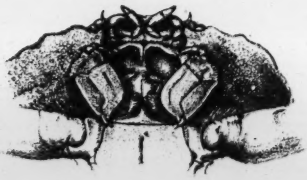
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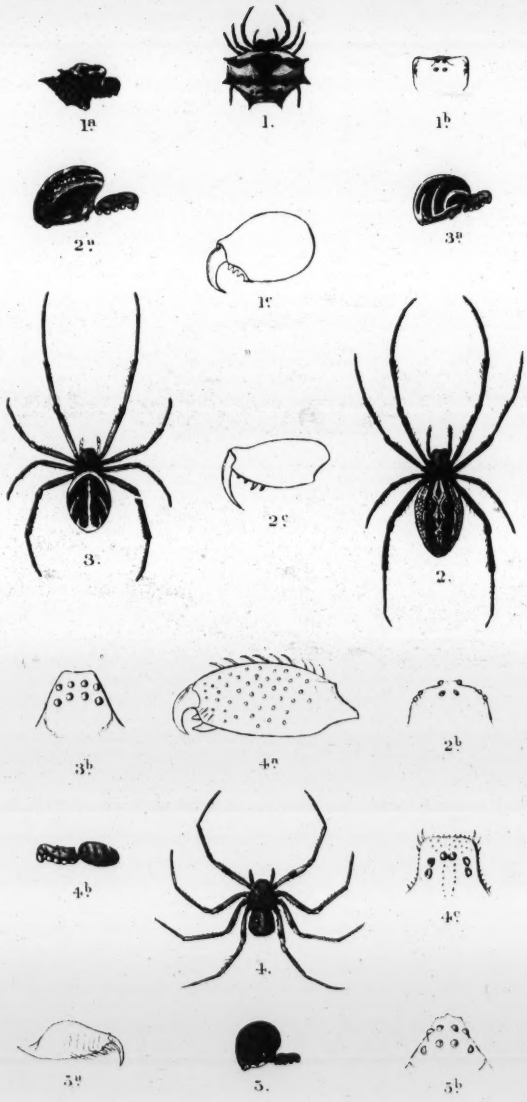


1ª

C.Berjeau lith.

Mintern Bros. imp.

1. LEPTODIUS COOKSONI.
2. CUBARIS GALAPAGOENSIS.



E.A. Smith.

Lantern Bros. imp.

SPIDERS OF THE GALAPAGOS.

I. Birds. By R. Bowdler Sharpe.

The specimens were thirteen in number, and preserved in spirits of wine. They were obtained on Charles and Albemarle Islands, the two of the group of which we appear to know least; indeed, from the latter island one species only, *Mimus parvulus*, is recorded by Mr. Salvin in his important memoir recently published (Trans. Zool. Soc. vol. ix. pp. 447–510). Commander Cookson obtained also a *Geospiza* on that island. The species of *Dendræca* is widely spread over the archipelago, and was previously known from Charles Island; but the existence of a *Pyrocephalus* in this locality is confirmed for the first time.

The exploration of Tower and Hood Islands is still a great desideratum: their birds are reported to be peculiar; but not a single example of them has as yet reached European collections.

It is very remarkable that (as Commander Cookson reports) the birds continue to be as tame as in former times, especially in Charles and Chatham Islands, which have been so long inhabited; the small birds of all kinds are so tame that they are easily knocked down with a switch, some of the men being able to kill numbers of doves in this manner.

1. Mimus parvulus.

Mimus parvulus (Gould); Salvin, *l. c.* p. 472.

A single specimen from Albemarle Island, measuring as follows—total length 8·4 inches, culmen 0·9, wing 3·95, tail 4·0, tarsus 1·3. Considerable differences exist between the bird now sent and the typical and unique specimen in the British Museum. It is much greyer, and the head is varied with ashy-brown margins to the feathers; the hinder neck is conspicuously lighter, the white sides of the neck converging and forming a half-collar; the rufous rump is very distinctly indicated, the upper tail-coverts being also shaded with rufous, all the feathers mottled and having brown centres; wing-feathers dark brown, all broadly tipped with white, these tips somewhat shaded with rufous on the inner secondaries and greater coverts; tail-feathers dark brown, edged with grey, the feathers all shading off into a white tip, broader on the inner web, the outer feather externally edged with whitish; lores and ear-coverts dark brown, slightly shaded with grey; a very distinct white eyebrow; cheeks and under surface of body pure white, the fore neck and breast distinctly spotted with triangular marks of brown.

Professor Sundevall is inclined to unite all the Galapagoan Mocking-Thrushes into one species; but Mr. Salvin points out that *M. trifasciatus* is a distinct species without doubt. In this I agree with him, the large size and very distinct endings to the wing-coverts and tail-feathers, and above all the broad edgings of brown to the breast-feathers, serving to separate it. But as regards the distinctness of *M. melanotis* and *M. parvulus*, Mr. Salvin is more in doubt; and I believe, with him, that "a larger series of specimens would show that the differences (in size alone) would gradually disappear."

The specimen sent by Commander Cookson exhibits a previously undescribed plumage of these insular *Mimi*; it is most probably a young individual.

2. DENDRŒCA AUREOLA.

Dendrœca aureola (Gould); Salvin, *t. c.* p. 473.

Three specimens from Charles Island, representing an old female, a young male, and a young female. The young male bird is in an interesting plumage, having the under surface yellow, the throat white with a few yellow feathers intermixed, while on the breast the reddish streaks are just beginning to appear.

3. GEOSPIZA FULIGINOSA.

Geospiza fuliginosa (Gould); Salvin, *t. c.* p. 482.

Three young specimens from Albemarle Island, whence no *Geospiza* has as yet been recorded. Two are nestlings, the smallest being uniform creamy buff below, and having very broad rufous edgings to the wing-coverts and quills. The specimen appears to be full-grown, and measures as follows—total length 3·9 inches, wing 2·4, tail 1·7, tarsus 0·8. The Albemarle species would appear from these dimensions to be *G. fuliginosa*, as they are too big for *G. parvula*, and there is also a specimen of a young *G. fuliginosa* from Indefatigable Island (*Habel*) in the British Museum, with the plumage of which the Albemarle skin agrees very well indeed.

4. PYROCEPHALUS NANUS.

Pyrocephalus nanus (Gould); Salvin, *t. c.* p. 492.

No specimens of these Ruby-crowned Flycatchers have been before recorded from Charles Island, though Dr. Habel says that the species was found on all the islands visited by him. Commander Cookson has sent five specimens, two of which, now that they are made into skins, are yellowish where the adults are red; this is probably owing to the action of the spirit upon the plumage, and does not point to the specific distinctness of the Charles-Island bird. A young male in changing plumage shows a decided shade of red appearing on the under surface.

II. REPTILES. By ALBERT GÜNTHER.

The two species of Tortoises (*Testudo microphyes* from Albemarle, and *Testudo abingdonii* from Abingdon Island) will be fully described and figured in the author's forthcoming work on Gigantic Land Tortoises.

Only five species of Lizards are known from the archipelago, of all of which specimens were obtained by Commander Cookson. For a full description and figures I refer to the excellent paper recently published by Dr. Steindachner ("Die Schlangen und Eidechsen der Galapagos Inseln," Festschrift der zool.-bot. Ges. Wien, 1876, 4to). Their distribution in the archipelago is as follows:—

1. Liocephalus grayi (Bell)=*Craniopeltis bivittata* (Ptrs.) according to Steindachner.

Chatham (*Darwin*).
Charles (*Darwin*).
Albemarle (*Cookson, Steindachner*).
James (*Steindachner*).
Indefatigable (*Steindachner*).
Jervis (*Steindachner*).
Abingdon (*Cookson*).

2. Liocephalus pacificus (Steind.).

? Indefatigable (*Habel*).
Bindloe (*Habel*).
Abingdon (*Cookson*).

3. Amblyrhynchus cristatus (Bell).

Generally distributed.

Commander Cookson states that the rocks at Iguana Cove were thickly covered with *Amblyrhynchi*. He found them in numbers at the other places he visited, but nowhere else so numerous and so large in size. Here they were found to weigh from 20 to 22 lb., against 12 to 14 from other localities.

4. Conolophus subcristatus (Bell).

Albemarle (*Darwin, Cookson*[1], *Steindachner*).
James (*Darwin*).
Barrington (*Darwin*).
Indefatigable (*Darwin*).

5. Phyllodactylus galapagensis (Ptrs.).

Charles (*Cookson*).

III. Fishes. By Albert Günther.

Of the twelve species enumerated below, five are new to the fauna of the Galapagos archipelago, viz. *Sargus unimaculatus, Argyriosus setipinnis, Hemiramphus unifasciatus, Clupea libertatis,* and *Balistes mitis.*

1. Centropristis psittacinus (Val.). Charles Island.

2. Serranus olfax (Jen.). Charles Island.

Jenyns (Zool. Beagle, p. 9, pl. 4) drew up his description from a dried skin which evidently is much distorted. Therefore it appears to be proper to give a new description from a specimen preserved in spirits, 17 inches long.

D. $\frac{11}{16}$. A. $\frac{3}{10}$.

Body compressed, of moderate height, its greatest depth being

[1] Only a mandible, from Iguana Cove.

equal to the length of the head and rather more than one third of the total length (without caudal). Upper profile sloping in a moderately strong curve from the commencement of the dorsal to the end of the snout. Lower jaw the longest. The teeth are in strong card in both jaws, the upper jaw with an outer series of stronger ones; one pair of canine teeth above and below, much stronger than any of the other ones. Vomerine and palatine teeth in narrow short bands. The diameter of the eye is one half the length of the snout, and two thirds of the width of the interorbital space. The maxillary, when the mouth is closed, reaches to behind the middle of the orbit. The *structure of the nostrils does not differ from that of the other species of the genus*: there are externally on each side two openings, a small anterior, and large posterior; they are separated by a narrow bridge of skin, which, in dried examples, would be very liable to shrink or disappear altogether. At the bottom of the posterior opening are the two apertures described by Jenyns which lead into the interior of the nasal organ.

The præoperculum is rather more than rectangular, the basal margin nearly straight and horizontal, the ascending margin finely denticulated with a shallow sinuosity above the angle. Operculum with a flat triangular spine.

Scales nearly smooth, lateral line not very conspicuous.

Dorsal spines slender, the second being the longest, its length contained twice and one fourth in that of the head. The length of the first spine is four ninths of that of the second, the third, fourth, fifth, and sixth spines gradually decreasing in length. Caudal subtruncated. Body uniform dark brown. Head and fins yellow.

3. Serranus humeralis (C. V.).
=*S. albomaculatus* (Jen.). Charles Island.

4. Pristipoma cantharinum (Jen.). Charles Island.

5. Chrysophrys taurina (Jen.). Charles Island.
Very closely allied to *Ch. calamus*.

6. Sargus unimaculatus (Bl.). Charles Island.

This fish is to be added to the list of species occurring on both sides of the Isthmus of Panama. Hitherto it was known from the Atlantic coasts of Tropical America (including the West Indies) only.

7. Doydixodon freminvillii (Val.). Charles Island (Post-Office Bay). Albemarle Island (Iguana Cove).

The number of dorsal rays varies from 15 to 17; that of the anal rays appears to be more constant, namely 12. With regard to the distribution of this fish on the Pacific side of the American continent, and the alleged presence of teeth on the palate, see Zool. Record, iv. p. 160.

8. Argyriosus setipinnis (Mitch.). Charles Island (Post-Office Bay).

9. Hemiramphus unifasciatus (Ranz.). Charles Island (Post-Office Bay).

This is one of the fishes which appear to extend within the tropics almost round the globe; hitherto it has not been brought from the West coast of Africa.

10. Clupea libertatis (Gthr.). Charles Island (Post-Office Bay).

11. Tetrodon heraldi (Gthr.). Charles Island (Post-Office Bay).

12. Balistes mitis (Benn.). Charles Island (Post-Office Bay).

IV. Mollusca. By Edgar Smith.

The shells collected by Commander Cookson are all from Charles Island. They belong to twenty-two species, the majority of which were previously known to have been found in the archipelago, though we were ignorant in some instances of the island on which they had been obtained. Six of the species are additions to this fauna, three of them being apparently undescribed.

A. *Marine Species.*

1. Purpura patula, Linn.

Both the normal form of the species and the variety (*P. columellaris*, Lamarck) occur at Charles Island. Some of the typical specimens with thin lips have the spire quite elevated, indeed quite as much so as certain of the variety with the thickened and strongly dentate labrum. One of the latter form is quite a curiosity, on account of its diminutive size and solidity, being only an inch in length and yet quite adult.

2. Purpura callaoënsis, Gray.

The single specimen from Charles Island differs from all Peruvian examples I have seen in having four stout lirations within the aperture, which do not reach to the margin of the labrum; and the four transverse ridges which usually encircle the body-whorl of this species are very well developed. The specimens in the Cumingian collection are stated to have come from the Galapagos Islands, according to a ticket preserved with them; but Reeve quotes Callao Bay as the home of the species.

3. Engina crocostoma, Reeve.

This species has been found at Panama; and the Philippine Islands were given by its author as the habitat.

4. Rhizochilus (Coralliophila) parvus, sp. nov. (Plate XI. fig. 6.)

Testa parva, fusiformi-ovata, vix rimata, alba; anfractus circiter 7, convexiusculi, longitudinaliter plicati, plicis obliquis 10–11 *validis, et liris spiralibus rugosis fortibus (in anfr. penult.* 5–6, *in ultimo circa* 18, *alternatim majoribus) cincti; apertura cæruleo-alba, pyriformis, ad basim canalem brevem aliquanto recurvum jungens, longitudinis totius ½ paulo superans; labrum crenulatum, intus denticulatum.*

Longit. 10½ millim., diam. fere 6.

This pretty species is of a short fusiformly-ovate shape, entirely white; the whorls are spirally lirated, two of the lirations on the upper whorls being stouter than the others; and those on the last are regularly alternately large and small, the stout ones being twice as thick as the latter. The aperture is bluish white, pyriform, and prolonged into the basal channel, which is somewhat recurved; the columella is straightish, thinly callous, smooth and shining; the labrum is strongly crenulated on the margin and armed within with about ten lirations, which do not extend far within the aperture.

Although there are not any very striking peculiarities in this little shell, still it does not satisfactorily agree with any other species. For its size the spiral ribs are remarkably stout, and are more conspicuous than the oblique plications.

5. Columbella fuscata, Sowerby.

Panama, Mazatlan, West Columbia, and Peru are other localities where this species has been found.

6. Latirus varicosus, Reeve.

It is curious that the single specimen obtained by Commander Cookson is in exactly the same worn condition as the shells originally described.

7. Latirus tuberculatus, Broderip.

Also found on the west coast of Central America.

8. Mitra (Stigatella) tristis, Swainson.

This species is also quoted from Mazatlan, Panama, and St. Elena, West Columbia.

9. Conus nux, Broderip.

10. Cirithium maculosum, Kiener.

11. Calyptræa, sp.

There are two small specimens of a species of this genus in the collection, probably the young stage of *C. tortilis*, Reeve, or *C. alveolata*, A. Adams, both of which are described as inhabitants of these islands. One of them has taken up its abode in the shell of a dead *Fissurella*, and has curiously extended the margin of its shell through the apical hole.

12. Hipponyx grayana, var., Menke.

A young shell, apparently belonging to this species, differs from the normal form in being much more coarsely radiately costated; and consequently the crenulation of the basal margin is considerably more conspicuous.

13. Rissoma stricta, Menke.

The single specimen from the Galapagos Islands agrees very closely with the description given by Menke (Zeitschrift für Malokozoologie, 1850, p. 177). The labrum is very greatly thickened, and the transverse liration is strongly developed around the lower half of the body-whorl. The whorls are ten in number, and have about twenty smooth ribs, which are slightly flexuous on the last. Fig. 25, on plate iii. of Schwartz von Mohrenstein's monograph of the genus, gives a very good representation of this species.

14. Trochus (Omphalius) cooksoni, sp. n. (Plate XI. fig. 7.)

Testa valde umbilicata, suborbiculata, levissime conoidea, fusco roseoque variegata, lineis albidis nigro articulatis obscure picta; anfractus 4½, sublævigati, convexiusculi, striis spiralibus paucis tenuibus insculpti; ultimus superne convexus, infra suturam leviter depressus, ad peripheriam complanatus, idcirco biangulatus, basi subplanus, tenuissime spiraliter striatus, circa umbilicum sulco haud profundo aratus; umbilicus albus, profundus, callo albido, ad basim columellæ dentem formante circumdatus; apertura suborbicularis; columella arcuata, anfractui callo juncta.

Diam. maxima 8 millim., minima 7, alt. 4.

This shell is deeply umbilicated, elevately orbicular, convex above, only slightly conical and flat beneath; the last whorl is flattened at its middle; and this produces a double angulation, which, however, is not very conspicuous; there is also a faint depression a little below the suture. The coloration of this species is not very definite; the upper surface is blotched irregularly with pink and brown, and some spiral, articulated lines, the base is a trifle paler; the only sculpture consists of fine spiral striations, which are most conspicuous on the base; the callus which surrounds the umbilicus is whitish, and terminates in a faint tooth on the columella, and is bordered by a shallow sulcus in the whorl. The columella terminates above in a callosity which extends upward some distance on the whorl, and also spreads out within the aperture.

T. occultus of Philippi, bears a faint relationship to this form, but is more conoid and more strongly sculptured.

15. Fissurella obscura, Sowerby.

16. Chiton (Lophyrus) goodallii, Broderip.

17. Chiton (Lophyrus) sulcatus, Wood.

18. Arca, sp.

Two small shells, probably the young of a a larger species, seem most nearly allied to *A. gradata*, Brod. & Sowb.; they are rather more finely reticulated than is usual with that species, but in form, and the position of the umbones, they agree very well.

B. *Terrestrial Species.*

19. Bulimus nux, Broderip.

The specimens of this species collected by Commander Cookson are very coarsely striated, and much darker in colour than those described by Broderip. They are striped longitudinally with a mixture of slate-colour and brown, with here and there some pale streaks; and some specimens have a distinct pale band around the middle of the body-whorl; and the four apical whorls are bluish black.

This species is considerably variable in form, some examples being much more elongate than others.

The following measurements show how great is the variation in length. One shell is 20 millims. long and 10 in diameter, and another very short one has a length of only 16 millims. and yet is the same width as the longer specimen.

20. Bulimus unifasciatus, Sowerby.

21. Bulimus escharifer us, Sowerby.

This species is quoted by Reeve as having been found at Chatham Island by Darwin. The Charles-Island shells are considerably larger than those from the above locality, and also coarser in sculpture, some of them displaying spiral granose or rugose striation as in *B. rugulosus* of Sowerby, from the same islands; and, indeed, they appear to be an intermediate variety or connecting link between the two species, both as regards size and sculpture. The largest specimen measures 19 millims. in length, and $7\frac{1}{2}$ in width.

22. Succinea bettii, sp. nov. (Plate XI. fig. 8.)

Testa ovata, superne aliquanto acuta, tenuissima, diaphana, flavocornea, versus apicem rubescens, irregulariter arcuatim striatula, nitens; anfractus 3, penultimus parvus convexus, ultimus maximus, inflatus; apertura ovata, superne angustata vix obliqua; columella obliqua, parum arcuata, tenuissime callosa; peristoma simplex regulariter arcuatum.

Long. 13 millim., diam. maxima 8, aperturæ longit. 10 millim., diam. $5\frac{3}{4}$.

Var. *Testa brevior.*

This species is most nearly allied to *S. rubicunda* Pfeiffer, which was described as coming from the island of Masafuera, off the coast of Chili. From it the present species differs in consisting of half a whorl more. This difference is quite apparent when the spires of the two species are regarded with the mouth of the shell towards the eye. The penultimate and apical whorls of the Galapagos species

will be seen to be considerably more elevated than in *rubicunda*. The colour of the latter is rather paler, except the apex, which is perhaps a trifle deeper in tint.

V. Crustacea. By Edward J. Miers.

But little attention has hitherto been paid to the Crustaceans of the Galapagos archipelago, except as regards the *Oxyrhyncha* (*vide* Bell, Zool. Trans. ii. p. 39 *et seq.* 1841); and Commander Cookson's collection contained four species only, two of which are well known and widely distributed, the two others being undescribed.

1. Leptodius cooksoni, n. sp. (Plate XII. fig. 1.)

Carapace smooth, transverse, scarcely at all convex, surface everywhere finely punctulated, the punctulations more crowded upon the anterior part. Frontal margin with the median fissure distinct, obscurely 4-lobed. The frontal, gastric, and antero-lateral regions areolated, the areolets and intervening fissures well defined. Antero-lateral margins obtuse and rounded, the tooth at the external orbital angle and the first marginal tooth quite obsolete, the three following teeth having the form of obscure rounded lobes. Posterior to the last tooth or lobe of the antero-lateral margin are two or three short, obscure, transverse lines. Anterior legs very strong, granulated; wrist and upper and outer surface of hand with numerous raised reticulating lines; a blunt tooth at the antero-internal angle of the wrist, and a slight ridge on the upper and inner margin of the hand, terminating posteriorly in a tubercle. Fingers black. Ambulatory legs short, smooth, and without hairs, except on the tarsi, which are closely tomentose. Abdomen of ♂ 5-, of ♀ 7-jointed. Length of carapace of ♂ about $\frac{7}{12}$ in. Breadth $\frac{11}{12}$ in.

Hab. Charles Island.

A single, apparently adult male is in the collection, and a female, much smaller. Their colour (in spirits) is dark reddish brown. This species has altogether the external aspect of a *Xanthodius*, but has not any trace of the ridge upon the palate, the character upon which the genus was founded by Stimpson. It is to be noted that in *Xanthodius* this ridge is not produced to the anterior margin of the buccal area, and, therefore, does not completely define the branchial channel; so that in fact the genus *Xanthodius* occupies an intermediate position between the Chlorodiinæ, in which the palatal ridge is entirely absent, and the Oziinæ, in which it is fully developed.

2. Grapsus pictus.

Pagurus maculatus, Catesby, Nat. Hist. Carolina, ii. pl. xxxvi. fig. 1 (1743).

Grapsus pictus, Latr. Hist. Nat. Crust. vi. p. 69 (1803): M.-Edw. Hist. Nat. Crust. ii. p. 86 (1837).

Hab. Charles Island.

One specimen of this species, an adult male (length $2\frac{3}{8}$ in., breadth

3 in.), is in the collection. It occurs in nearly all the warmer temperate and tropical seas of the globe.

The specimen from Charles Island resembles in all respects specimens of *G. altifrons*, Stimpson (Ann. Lyc. Nat. Hist. New York, vii. p. 230, 1860), in the collection of the British Museum, from Cape St. Lucas, California, presented by the Smithsonian Institution. This species cannot be regarded as distinct from *G. pictus*, as the characters given are by no means constant or restricted to Western-American specimens.

3. REMIPES PACIFICUS.

Remipes pacificus, Dana, U.S. Expl. Exp. xiii. Crust. i. p. 407, pl. xxv. fig. 7 (1852).

Hab. Charles Island.

One specimen was obtained.

This species was described by Dana from specimens collected at the Fiji and Sandwich Islands; its occurrence at Cape St. Lucas, California, has since been recorded by Stimpson; and specimens from the last-mentioned locality, presented by the Smithsonian Institution, are in the collection of the British Museum. There are also specimens in the collection from the New Hebrides, Fiji, Navigators', and Samoa Islands, the coast of Australia, the Philippines, and Mauritius.

I think it not improbable that this species may be identical with the *Remipes testudinarius* of Latreille (Gen. Crust. et Ins. i. p. 45), described and figured by Milne-Edwards (Hist. Nat. Crust. p. 206, pl. xxi. figs. 14–20), from Australia.

4. CUBARIS GALAPAGOENSIS, sp. n. (Plate XII. fig. 2.)

Convex, narrow-oblong, minutely punctulated, and strongly granulated. Head narrow-transverse, with two or three small granules near its posterior margin. Eyes very small, black. First segment of the body with two larger sigmoid elevations on its dorsal surface, near its anterior margin, the granulations less regular and more numerous than on the succeeding segments; the six succeeding segments with a transverse series of about six regularly placed granules near the posterior margin, and two or three in front of them, on each side of the middle line a group of larger granules; towards the lateral margins the granules again become uniseriate. Segments of the tail with but one or two small granules towards the lateral margins; last segment concave on the sides, wider at its proximal than at its distal extremity, and with three small granules on its upper surface. Antennæ with the penultimate about half the length of the last joint. Colour iron-grey, segments with paler margins and patches on each side of the middle line.

Hab. Charles Island.

A single specimen is in the collection. This species is distinguished from most of its congeners by the strongly granulated segments of the body. In *C. cubensis*, De Saussure (Mém. Soc. Phys. et Hist. Nat. Genève, xiv. (2) p. 481, pl. v. fig. 42, 1858), the segments

are granulated on each side, but the transverse series of submarginal granules are wanting.

VI. Myriopoda and Arachnida. By A. G. Butler.

Myriopoda.

1. Scolopendra complanata.

Scolopendra complanata, Newport, Ann. & Mag. Nat. Hist. 1st ser. xiii. p. 99.

One example, Charles Island.

Arachnida.

1. Androctonus americus.

Androctonus americus, Linnæus, Syst. Nat. 2, p. 1038. no. 4.

One example, Charles Island.

2. Lycosa indomita.

Lycosa indomita, Nicolet, Gay's Hist. Fis. de Chili, Aran. pl. 2. fig. 12 (1854).

One example, Charles Island.

Previously known from Chili.

3. Theridion carolinum, n. sp. (Plate XIII. figs. 3, 3ª, 3ᵇ.)

♀. Cephalothorax testaceous, cordiform, truncate in front, caput ascending, about half the width of the pectoral region, separated by an oblique depressed line on each side, and having a central longitudinal brownish line; eyes amber-coloured with black margins, arranged in two very slightly convex rows across the anterior part of the caput; the four central eyes forming a nearly regular square, the posterior pair being larger; the lateral pairs placed obliquely; abdomen ovate, black, with a dorsal longitudinal moniliform band, and three converging oblique lateral stripes (not reaching the central band) whitish; legs ochraceous, setose; tibiæ banded with brown, palpi rather slender, testaceous, brownish at the tips; maxillæ and falces testaceous; pectoral plate scutiform, testaceous in the middle, brown on each side; ventral surface of abdomen with a broad longitudinal irregular whitish band, and a marginal streak of the same colour on each side. Length 7 millims; relative length of legs 1, 4, 2, 3.

One example, Charles Island.

4. Latrodectus apicalis, n. sp. (Plate XIII. figs. 5, 5ª, 5ᵇ.)

♀. Cephalothorax shining piceous, cordiform, truncate in front, caput ascending, separated by a strongly defined depressed oblique line on each side; anterior eyes blackish, posterior amber-yellow, arranged in two convex rows on the front of the caput; the four central eyes forming a nearly regular quadrangle, the posterior pair being larger; the lateral pairs placed rather further back and

obliquely; abdomen ovate, shining, piceous, with bronzy reflections, densely setose; a dorsal longitudinal ill-defined carina, and on either side a series of about five punctures; an apical white-tipped irregular orange spot; legs shining, piceous, setose; proximal extremities of tibiæ and the metatarsi slightly reddish; maxillæ and falces dark olivaceous; pectoral plate scutiform, dark olivaceous; ventral surface of abdomen olivaceous at the base, a central laterally excised large orange spot. Length 9 millims.; relative length of legs 1, 4, 2, 3.

Four examples, Charles Island.

This species seems most nearly to approach *L. formidabilis* of Nicolet. Two of the examples are much paler than the type, their abdomens having a greyish appearance.

5. EPEIRA COOKSONII, n. sp. (Plate XIII. figs. 2, 2^a, 2^b, 2^c.)

♀. Cephalothorax reddish tawny, with three (central and lateral) longitudinal brown stripes, elongate cordiform, truncated in front, nearly flat, with a deep depression behind the head; eyes arranged on the front margin of the caput, the four central ones forming an elongate quadrangle upon a central prominence, the lateral pairs placed further back at the anterior angles of the cephalothorax, very small; abdomen velvety black, with a beautiful longitudinal sceptre-like band, and dotted lateral stripes, gold, the inner margins of the lateral stripes indicated by an interrupted sinuated golden line; legs reddish tawny, the distal extremities of the tibiæ, metatarsi, and tarsi blackish, the femora and tibiæ sprinkled with black bristles, the metatarsi and tarsi clothed with black hairs; palpi ochraceous, setose, with blackish terminal joint; falces mahogany-red, maxillæ and labrum deep castaneous, bordered with ochraceous; pectoral plate subpyriform, pentagonal, piceous, with a longitudinal central testaceous streak; ventral surface of abdomen velvety black, castaneous at the base, streaked at the sides with undulating lines of silvery hair; four large central pale ochraceous spots, in the centre of which is a whitish spot; a red spot on each side of the region of the spinners. Length 16 millims.; relative length of legs 1, 4, 2, 3.

Nine examples, Charles Island; six specimens, Albemarle Island.

Var. abdomen olivaceous, markings whitish.

One specimen, Albemarle Island.

This beautiful species is most nearly allied to *E. oaxacensis* of Keyserling, the figure of which would almost answer for it; but the description of the coloration does not at all agree with it.

6. GASTERACANTHA INSULANA. (Plate XIII. figs. 1, 1^a, 1^b, 1^c.)

Gasteracantha insulana, Thorell, Öfvers. Vetensk. Akad. Förhandl. xvi. p. 302. no. 8 (1859, edit. 1860); Eug. Resa, Zool. Arachn. p. 17 (1868).

Seven specimens, Charles Island, one specimen, Albemarle Island.

This very handsome species was originally described as from the Galapagos Islands.

7. THOMISOIDES UTRIFORMIS, n. sp. (Plate XIII. figs. 4, 4ª, 4ᵇ, 4ᶜ.)

Cephalothorax cordiform, truncate in front (the caput nearly straight at the sides), orange-tawny, pilose, with marginal and radiating lines of short black setæ; eyes pale olive-hyaline, the central pair close together on the centre of the anterior margin of the caput, lateral pairs tolerably wide apart, placed on the lateral anterior margins of the caput, slightly obliquely; abdomen trapezoidal, excavated in front, transversely wrinkled and bisinuate behind, pilose, sordid ochraceous, clothed in front with coarse black setæ, a series of depressions on each side; legs testaceous, banded with grey, with longitudinal series of short black setæ; palpi testaceous, setose; falces castaneous, setose; maxillæ and labrum castaneous; pectoral plate testaceous, circular, slightly truncated in front and behind; abdomen below olive-brown, paler at base. Length 9 millims.; relative length of legs 2, 1, 3, 4.

One specimen, Charles Island.

Most like *T. rubripes* of Nicolet.

VII. COLEOPTERA. By C. WATERHOUSE.

GEODEPHAGA.

SELENOPHORUS GALAPAGOËNSIS, G. R. Waterh.

The type of this species, found by Mr. Darwin and described as "*piceus*," is evidently immature, as the two specimens just received from Commander Cookson (unfortunately also both females) are almost black above, but very slightly æneous when viewed obliquely. The larger specimen measures $4\frac{4}{5}$ lines.

Hab. Charles Island (*Darwin* and *Cookson*).

HYDRADEPHAGA.

EUNECTES OCCIDENTALIS, Er.

Six examples, which agree very well with the brief description of this species.

Hab. Charles Island (*Cookson*).

ACILIUS INCISUS, Aubé, var.

Three examples. The male agrees perfectly with that of *A. incisus*. The female differs in having the thorax more punctured, and in having the elongate punctures on the elytra much stronger and more close than in any examples of *incisus*; and the punctures, although diminishing in strength and density, extend nearly to the apex.

As considerable difference is admitted to exist in this respect in *A. circumscriptus*, the specimens from Galapagos must, I think, be considered mere varieties of *A. incisus*.

Hab. Charles Island (*Cookson*).

PALPICORNIA.

TROPISTERNUS LATERALIS, Fab.

This species has already been recorded from the Galapagos, and appears to be common there.

Hab. Charles Island (*Darwin* and *Cookson*).

NECROPHAGA.

ACRIBIS, gen. nov.

Head large, broad, convex above; epistoma slightly produced, narrow; antennæ about as long as the head, 1st joint rather elongate, 2nd short obconic, 3rd as long as the 2nd and more slender, 4th to 7th becoming gradually shorter, 8th nearly globular, the 9th, 10th, and 11th forming a large ovate compressed club. Intermediate legs retractile; posterior femora partially covered by the posterior margin of the metasternum. Basal segment of the abdomen large, the 2nd and 3rd very short.

Closely allied to *Clambus*, which it resembles in general form.

ACRIBIS SERRATIVENTRIS, sp. n.

Subglobosus, niger, nitidus, discrete subtilissime punctulatus; capite subtus antennisque piceo-testaceis; elytris apice obtuse rotundatis; abdomine piceo, segmentis marginibus minute serratis. Long. $\frac{2}{3}$ millim.

Build of *Clambus minutus*, but smaller and not so much narrowed posteriorly. Shining black. Head large, very broad and very convex, angular at the sides, emarginate on each side of the base of the epistoma at the insertion of the antennæ. Thorax ample, the whole surface marked with fine transverse scratches, and sparingly and very finely punctured (as are also the head and elytra), each puncture bears a short fine black hair; the posterior angles are broadly rounded. Scutellum triangular, short, and very broad. Elytra convex, but less so posteriorly, a little longer than broad, not much narrowed towards the apex, which is broadly rounded.

Underside. — Head beneath pitchy testaceous. Thorax below deeply excavated for the reception of the head in repose. Intermediate legs, when retracted, completely hidden by the posterior portion of the mesosternum. Metasternum a little shorter than the basal segment of the abdomen, with its posterior margin slightly flexuous in the middle. Posterior femora rather large, well separated from each other at their bases; tibiæ about $\frac{2}{3}$ the length of the femora: posterior tarsi as long as the tibiæ, rather stout. Abdomen pitchy, the margins paler, the margins of the 1st to 4th segments serrate or, rather, minutely toothed like a comb; the basal segment, as well as the sterna, are distinctly and moderately thickly pencilled.

Hab. Charles Island (*C. Darwin*).

PHALACRUS DARWINII, sp. n.

Oblongo-ovalis, convexus, piceo-niger, nitidissimus; antennis pe-

dibusque obscure testaceis; elytris punctorum seriebus duabus, singulis stria suturali, antice abbreviata, impressis. Long. 1½ millim.

Nearly black; the head pitchy. Thorax (when seen under a microscope) sparingly punctured. Elytra with an impressed sutural stria, only visibly punctured when seen under the microscope; parallel to this stria is a row of punctures, a little further removed from the stria than the stria is from the suture; there is a second row of punctures, but it is not quite so distinct as the first.

Hab. Charles Island (*C. Darwin*).

Malacodermata.

Melyridæ.

Ablechrus, gen. nov.

Eyes entire, not very prominent. Antennæ inserted in front of the eyes, of 9 joints, the 1st joint short obconic; the 2nd as long as broad; 3rd as long as the first, a little rounded at its base; 4th and 5th as long as the 3rd, subcylindrical; the 6th and 7th a little shorter; the 8th one third longer than broad, narrowed at its extreme base; the 9th joint one third longer than the 8th, elongate-ovate, subacuminate at the apex. Thorax convex, transverse, rounded at the sides and behind. Elytra at their base not broader than the thorax, but somewhat suddenly widened below the shoulders, ample posteriorly, rounded at the apex.

This insect closely resembles *Ebæus thoracicus* in form; the structure of the antennæ, however, is quite different, and unlike any genus of Melyridæ with which I am acquainted. Its position would be near *Ebæus*.

Ablechrus flavipes, sp. n.

Æneus, nitidus, vix pubescens; thorace transverso, cum elytris sat crebre evidenter punctato, his thorace fere triplo longioribus, basi thorace haud latioribus, postice ampliatis, apice rotundatis; antennis flavo-testaceis, articulis tribus apicalibus infuscatis; pedibus flavis. Long. 2 millim., lat. 1 millim.

General form that of *Ebæus thoracicus*, but smaller and relatively a trifle shorter; thorax rather convex, a little narrowed in front, very finely margined at the sides and posteriorly, distinctly and rather thickly punctured. Scutellum distinct. Elytra at their base not broader than the thorax, but immediately becoming broader and rounded posteriorly. Legs yellowish; the posterior tibiæ slightly curved; apex of tarsi slightly infuscated.

Hab. James Island (*C. Darwin*).

Heteromera.

Stomion galapagoënsis, G. R. Waterh.

Three examples were brought by Commander Cookson.

AMMOPHORUS COOKSONI, sp. n.

Oblongus, ater, vix nitidus; capite lato, planato, crebre fortiter longitudinaliter ruguloso-punctato: thorace quam caput ¼ latiore, latitudine quam longitudo ⅕ majore, sat convexo, confertim fortiter punctato, antice posticeque oblique angustato, lateribus medio subparallelis, angulis anticis subacutis prominulis, posticis acutiusculis vix divaricatis; elytris basi thorace haud latioribus, postice paulo ampliatis, convexis, fortiter late sulcatis, sulcis seriebus punctorum magnorum transversim impressis, interstitiis angustis cariniformibus, nitidis; humeris denticulo acuto armatis; pedibus brevibus obscure piceis, tibiis asperatis. Long. 3 lin., lat. 1⅓ lin.

This species is closely allied to *A. obscurus*, G. Waterh., but is relatively broader. The 4th to the 11th joints of the antennæ are very strongly transverse; the forehead is more strongly punctured; and the interspaces are inclined to form rugulæ, especially near the eyes. The thorax is more strongly punctured, about ¼ broader than



5.

long (whereas in *A. obscurus* it is only as broad as long); the sides are more sinuous. The costæ of the elytra are more pronounced, and the channels are more slightly punctured. The legs are shorter somewhat and rough.

Hab. Charles Island. Brit. Mus.

PHYTOPHAGA.

HALTICIDÆ.

DOCEMA, gen. nov.

Antennæ approximate at their base. Claws simple. Cotyloid cavities for the anterior coxæ open. Prothorax marked posteriorly with a transverse impressed line, not bounded on each side by the short longitudinal impression. Posterior femora not reaching to the extremity of the elytra. Basal joint of the posterior tarsi as long as the two following joints taken together; the 2nd and 3rd joints about as long as broad.

The position of this genus appears to me to be next to *Graptodera*.

1. Docema galapagoënse, G. R. Waterh.

Haltica galapagoënsis, G. R. Waterh. Ann. and Mag. N. H. 1845, xvi. p. 39.

Hab. Charles Island (*C. Darwin*).

2. Longitarsus lunatus, sp. n.

Ovalis, convexus, piceo-testaceus, nitidus; thorace convexo, paulo latiore quam longiore, postice parum angustato, fere lævi; elytris basi thorace vix latioribus, medio rotundato-ampliatis, crebre evidenter punctatis, lunula communi picea notatis. Long. 1¾ millim.

Closely resembles *L. ballotæ*, Marsh., in form and general appearance. The antennæ are nearly the same; but the second joint is a little more pear-shaped; and the third is as long as the second, but more slender. The thorax is a trifle less broad, and not visibly punctured. The elytra are very convex, much rounded at the sides, broadest across the middle, the shoulders almost completely effaced; the surface is somewhat uneven, which makes the punctuation less distinct; and the punctures are rather closer and finer than in *L. ballotæ*; a lunate pitchy band is placed across the middle.

Hab. Charles Island (*C. Darwin*).

Galerucidæ.

Diabrotica limbata, sp. n.

Nigra, nitida; thorace pallide flavo; elytris piceis, obsolete costatis, inter costas irregulariter biseriatim striato-punctatis, apice lævi, marginibus flavis; antennis basi pedibusque obscure testaceis, tarsis fuscatis. Long. 2 lin.

Head shining black. Thorax scarcely broader than long, a little narrowed towards the base, pale yellow, with two well-marked depressions on the disk. Elytra pitchy; at their base not quite twice as broad as the thorax, rather broader behind, obsoletely costate towards the sides, with double irregular lines of distinct (but rather fine) punctures between the costæ; the apex nearly smooth; the margins pale yellow, the yellow part widening at the apex. Legs yellowish, the knees and tarsi slightly dusky.

Hab. James Island (*C. Darwin*).

The following are the species of Coleoptera known to me to have occurred in the Galapagos Islands.

1. Albemarle Island.

Corynetes rufipes, *Fabr.*

2. James Island.

Notaphus galapagoënsis, *G. R. Waterh.*
Dermestes vulpinus, *Fabr.*
Ablechrus darwinii, *C. Waterh.*
Corynetes rufipes, *Fabr.*
Ammophorus bifoveatus, *G. R. Waterh.*

Anchonus galapagoënsis, *G. R. Waterh.*
Diabrotica limbata, *C. Waterh.*
Scymnus galapagoënsis, *G. R. Waterh.*

3. Chatham Island.

Creophilus villosus, *Grav.*
Bostrichus uncinatus, *Germ.*[1]
Ammophorus galapagoënsis, *G. R. Waterh.*
Pedonœces pubescens, *G. R. Waterh.*

4. Charles Island.

Selenophorus galapagoënsis, *G. R. Waterh.*
Eunectes occidentalis, *Er.*
Acilius incisus, *Aubé.*
Tropisternus lateralis, *Fabr.*
Acribis serrativentris, *C. Waterh.*
Phalacrus darwinii, *C. Waterh.*
Stomion galapagoënse, *G. R. Waterh.*
Ammophorus cooksoni, *C. O. Waterh.*
Ormiscus variegatus, *G. R. Waterh.*
Otiorhynchus cuneiformis, *G. R. Waterh.*
Docema galapagoënsis, *G. R. Waterh.*

5. The particular island not specified.

Feronia calathoides, *G. R. Waterh.*
Feronia insularis, *Bohem.*
Feronia galapagoënsis, *G. R. Waterh.*
Amblygnathus obscuricornis, *G. R. Waterh.*
Copelatus galapagoënsis, *G. R. Waterh.*
Philhydrus, sp.
Copris lugubris, *Bohem.*
Oryctes galapagoënsis, *G. R. Waterh.*
Physorhinus galapagoënsis, *G. R. Waterh.*
Stomion helopoides, *G. R. Waterh.*
Stomion lævigatum, *G. R. Waterh.*
Ammophorus obscurus, *G. R. Waterh.*
Pedonœces galapagoënsis, *G. R. Waterh.*
Pedonœces morio, *Bohem.*
Phaleria manicata, *Bohem.*
Eburia amabilis, *Bohem.*

VIII. Hymenoptera and Diptera. By Fred. Smith.

The Hymenoptera collected by Commander Cookson are referable to two species. Three other species collected by Mr. Darwin during the Voyage of the 'Beagle,' specimens of which were quite recently deposited in the British Museum by G. R. Waterhouse, Esq., may be added on this occasion.

[1] The "*Apate*" mentioned by Mr. Waterhouse, Ann. and Mag. Nat. Hist. 1845, xvi. p. 36.

1. CAMPONOTUS SENEX, Smith, Cat. Hymenopt. part vi. p. 47.
From Charles Island (*W. E. Cookson*).

2. CAMPONOTUS PLANUS.

Worker. Length, 1¾ line. Black, with the legs, antennæ, and mandibles ferruginous; thinly sprinkled with pale glittering hairs. Head slightly shining, oblong, a little wider than the thorax, with the eyes prominent and situated high at the sides near the vertex. Thorax rounded anteriorly, flattened above, and gradually narrowed to the metathorax, which is truncate behind; the sutures dividing the pro-, meso-, and metathorax only slightly impressed. Abdomen ovate, semiopaque; the node of the petiole incrassate, narrow, the sides nearly parallel, rounded above.
Charles Island (*C. Darwin*).

3. CAMPONOTUS MACILENTUS.

Worker. Length, 2¼ lines. Pale ferruginous, with the legs pale testaceous, smooth and shining, and having a few erect scattered pale hairs. The head wider than the thorax, oblong, with the eyes large, ovate, and black; the vertex slightly emarginate behind. Thorax compressed and much narrowed behind, convex above. Abdomen wider than the head, and oblong-ovate. The scale of the petiole wedge-shaped and rounded above.
Charles Island (*C. Darwin*).

4. AGRIOMYIA VAGANS.

Female. Length 2 lines. Head and thorax rufo-piceous; abdomen pale ferruginous, smooth and shining. Head oblong, the vertex rounded behind; the mandibles and antennæ paler than the head. Thorax a little longer than the head, deeply strangulated between the pro- and metathorax; the former rounded in front and very convex; the metathorax abruptly truncated obliquely; the legs rufo-piceous, with the tarsi and the articulations pale testaceous; the tibiæ paler than the femora and spinose exteriorly. Abdomen oblong, cylindric, and one third longer than the head and thorax, mottled with dark rufo-piceous stains; the second segment with three or four transverse impressed lines; the apex acute.
On comparing this insect with females of the different genera into which the genus *Thynnus* has been divided, it appears from its general structure to belong to the genus *Agriomyia* of Guérin.
Charles Island (*C. Darwin*).

5. XYLOCOPA MORDAX, Smith, Trans. Ent. Soc. Lond. 1874, p. 294, ♀.

Male. Length 8 lines. Ochraceous, the ocelli and mandibles black, the latter with a yellow spot at their base; the clypeus with a rufo-fuscous longitudinal line in the middle; the antennæ fuscous above; the pubescence fulvous. The mesothorax smooth and shining on the disk, as is also the scutellum; both nearly impunctate, having only a few very fine punctures: the mesothorax blackish on each

side and closely punctured. Wings fulvo-hyaline, their nervures dark ferruginous; the femora rufo-piceous, palest towards their apex; the pubescence on the thorax and legs fulvous. The apical margins of the segments of the abdomen rufo-piceous; the pubescence fulvous.

Albemarle Island, Charles Island (*W. E. Cookson*).

Of DIPTERA, Commodore Cookson collected two species in Charles Island, one being the *Musca ochricornis* of Wied., the other apparently new—

SYRPHUS ALBOMACULATUS.

Length 4 lines. The front covered with silvery tomentum, as well as the posterior margin of the head behind the eyes. The thorax of a metallic blue-green; the scutellum rufo-piceous, with its posterior margin pale testaceous. Wings hyaline and splendidly iridescent; the nervures dark fuscous. The legs rufo-piceous, with the anterior tibiæ, the base of the intermediate and posterior pair, and also the tips of the femora pale rufo-testaceous. Abdomen blackish brown, smooth and shining; at the base of the second and third segments laterally a large white isosceles-triangular macula.

IX. NEUROPTERA. By R. MCLACHLAN.

Only two species collected; both are Dragonflies, belonging to the subfamily *Libellulina*.

1. PANTALA HYMENÆA.

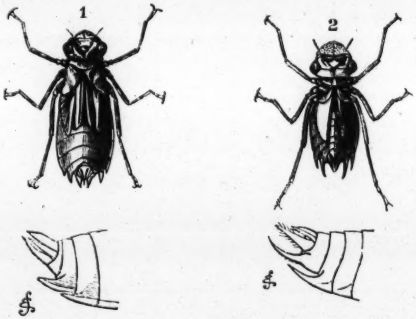
Libellula hymenæa, Say, Journ. Acad. Philad. vol. viii. p. 19.
Pantala hymenæa, Hagen, Neurop. N. Amer. p. 142.

One individual. In the 'Neuroptera of North America,' Hagen records this only from Indiana, Western Texas, and Mexico. Later on, in his "Synopsis on the *Odonata* of America" (Proc. Bost. Soc. Nat. Hist. vol. xviii. May 1875), he adds Illinois and Cuba as localities. In the 'Entomologist's Monthly Magazine,' vol. xi. p. 92 (September 1874), I noted that Mr. G. F. Mathew, R.N., found the species at Payta, Peru, and says of it:—"This fine species occurred along the sea-coast. I cannot imagine where the larvæ fed, as there was no fresh water within many miles of Payta, and rain is almost unknown there. Just above high-water mark, in some places, there were large patches of a species of *Mesembryanthemum*; and these dragonflies were always to be found hawking above them." I possess an example from Chili. There can be little doubt that the species is migratory, though not to the same extent as its congener *P. flavescens*, which is found almost all over the world.

2. TRAMEA, sp.?

Three individuals. As these examples are in bad condition, and having regard for the difficulties that surround the group, I do not venture to describe them, although they possibly pertain to a new species, of large size (almost as large as *Pantala hymenæa*), and with

only a very small dark anal spot on the hinder wings, in this latter character differing from most of the species of Central America.



There are also two "nymph"-forms, which I was at first inclined to consider only conditions of one species, but which I am now convinced represent the nearly mature condition of two; and it may be that they pertain to the *Pantala* and *Tramea* respectively.

The larger form (*Pantala*?) (fig. 1) may be described as follows:—Length, 23 millims. Body above (exceptiug the eyes and anal processes) uniformly opaque, pulverulent, brownish grey; beneath, dingy yellowish and shining. Eyes yellowish. Mask of labium elongate, its anterior edge forming a triangle with obtuse apex. Mandibles very large and prominent, standing out much in advance of the front of the head, their interlocked edges with about eight rather blunt teeth; very convex externally, forming (with the mask) a gibbous projection. Head above with a large and deep triangular depression behind the region of the ocelli. Pronotum with rounded hinder margin. Anterior rudimentary wings very narrow, lanceolate, extending to the hinder suture of the sixth abdominal segment; posterior broad in the anal portion, rather longer than the anterior. Abdomen short and broad, a small black triangular spot in the middle of the hinder suture of each ventral segment; the alate marginal portion very broad if viewed from beneath. Eighth segment produced at the sides into a strong flattened acute tooth, furnished with small distant spines on the edge. Ninth produced into a much longer and broader curved tooth, broadly triangular at its base, also with small spines on its edge. The form of the anal valves &c., is as follows:—Median dorsal process long and very strong, its sides dilated and triangular at base, the upper edge forming a sharp keel. Lateral superior processes slender and much shorter. Lateral inferior processes long, lanceolate, and very acute, scarcely shorter than the median dorsal process, slightly curved. All the anal processes shining, and dingy yellowish. Legs slender, not especially long, concolorous with the body; but on the femora and tibiæ there are indications of broad fuscescent rings, and the intermediate and posterior tarsi are blackish.

The smaller "nymph" (*Tramea*?) (fig. 2) is only 19 millims. long. Uniformly very shining, brown, with a tinge of blackish above; pale greyish yellow beneath. Eyes deep black. Mouth-parts even still more prominent than in the form above described: mandibles thickly sprinkled with small blackish dots; the interlocked edges without visible teeth. Head above with an oblong depression behind the region of the ocelli, with a lateral extension on each side, dilated, and forming broad shallow pits, in which the antennæ are inserted. Pronotum with a broad yellowish median band; its posterior edge raised and rounded. Anterior rudimentary wings narrow, extending over the hinder margin of the 7th segment; posterior very broad at the base in the anal portion, network distinct, the apices extending to beyond the middle of the 8th segment. Abdomen very short and broad; each ventral segment with two small blackish spots, having a tendency to form two lines on the terminal segments; alate lateral portions extremely broad; 8th and 9th segments each produced laterally and posteriorly into a lanceolate acute process, with fine spines on the outer edge, that on the 8th extending to about the apical margin of the 9th, that on the latter equally long, and extending beyond the anal processes. Median dorsal anal process lanceolate, strong, curved downward, its dorsal edge with long blackish spines towards the apex. Lateral superior processes slender and spiniform, blackish at the tips, as long as the dorsal. Lateral inferior processes much longer, stronger, and nearly straight, furnished with long and strong black spines, inferiorly at the base with long yellowish spiniform hairs. Legs much longer than in the form above described, more slender, pale brownish, but with a faint blackish line on the femora and tibiæ externally, and with blackish tubercles on their edges, whence arise short yellowish spines.

This "nymph" is evidently in its last stage before the exclusion of the imago. The neuration of the hind wings is distinct; and the position of the triangle warrants the belief that it pertains to *Tramea*.

Upon comparing these "nymphs" with those of two familiar European species, viz. *Plathemis depressa* and *Diplax striolata*, the most striking feature is the greater prominence of the mouth-parts, the longer and more slender legs, and the absence of the dorsal dentate crest on the abdomen. *P. depressa* has the angles of the apical segments not produced into processes; but in *D. striolata* the processes are very evident, and approach the forms here described.

X. Lepidoptera, Orthoptera, and Hemiptera.
By A. G. Butler.

The following list contains not only the species collected by Commander W. E. Cookson, but also some Hemiptera discovered by Charles Darwin, Esq., during the visit of the "Beagle," and recently deposited in the British Museum.

Among the species most worthy of note may be especially mentioned a beatiful little moth (*Cydosia sylpharis*, n. sp.) obtained by Commander Cookson, and certainly the most splendidly coloured form of that genus yet described.

Lepidoptera.

1. Deiopeia ornatrix, var.

Noctua ornatrix, Linnæus, Syst. Nat. ii. p. 829.

One specimen, Albemarle Island, June 23, 1875.

This is the less heavily marked form of the species, also taken in the Galapagos Islands by Darwin.

2. Cydosia sylpharis, sp. n.

Primaries dark metallic green; an abbreviated subcostal longitudinal streak, a much longer longitudinal submedian streak, an interrupted longitudinal internal streak, a basicostal litura, several costal spots, a large oblique subapical spot, and a congregation of dots upon the disk towards the external angle silvery white; a spot above the end of the cell, and a second at external angle, bright golden; secondaries hyaline whitish, the veins brown; the borders brownish grey, diffused internally; discoidal cell and area beyond it greenish iridescent; thorax metallic green, spotted with white; body bronzy, greenish towards its anal extremity, white at the sides, primaries below shining brown, secondaries hyaline, with the veins and borders brown; pectus brown, spotted with white, anterior coxæ golden; venter bronzy green, with a central series of large white spots; expanse of wings 1 inch 2 lines.

One example, Albemarle Island, June 23, 1875.

This and the preceding species, although sent in spirit, are in very fair condition.

There are also in Commander Cookson's collection two larvæ of a *Sphinx* moth, two of a Geometer, and a pupa of (apparently) a Pyralide, from Charles Island.

Orthoptera.

1. Panchlora surinamensis.

Blatta surinamensis, Linnæus, Syst. Nat. ii. p. 687.

Charles Island (2 adult, 2 immature).

2. Periplaneta americana.

Blatta americana, Linnæus, Syst. Nat. ii. p. 687.

Charles Island (2 adult examples).

3. Agrœcia cooksonii, n. sp.

♀. Above piceous or black, mottled with testaceous; head almost uniformly black; frons castaneous, testaceous at the sides; mandibles black, castaneous at the base; under surface of the body testaceous; oviduct testaceous, its outer half blackish along the margins.

Head dull, nearly smooth, rather broader than the prothorax, an obtuse prominence between the antennæ; antennæ about twice the length of the body; eyes very prominent; frons shining, punctured in the middle; mandibles deeply grooved externally; thorax rugose, with lateral carina; wings undeveloped; abdomen obovate, dorsally

carinate, terminal appendages above short, curved, subpyriform; oviduct much compressed, very acute, curved upwards, not so long as the abdomen; anterior coxæ with a short anterior external fusiform spine; anterior femora with three increasing denticles towards the distal extremity of their infero-interior margin; tibiæ with seven pairs of short acute spines along their inferior margins; middle coxæ without spine; posterior femora with four denticles; posterior tibiæ with ten pairs of short acute spines. Length of the body 11 to 20 lines, oviduct 5 to 7 lines.

Three examples, Charles Island; two examples, Albemarle Island, June 23rd.

The type is from Charles Island; it is the largest and most nearly adult example sent; the smaller examples are much paler.

4. ACRIDIUM MELANOCERUM.

Acridium melanocerum, Stål, Eug. Resa, p. 326.

Five examples, Charles Island; three examples, Albemarle Island.

5. ACRIDIUM LITEROSUM.

Acridium literosum, Walker, Cat. Derm. Salt. iv. p. 620.

Two examples (one immature), Charles Island.

6. VATES? sp. (larval form).

Two examples, Charles Island.

HEMIPTERA.

1. SCIOCORIS GALAPAGOËNSIS, n. sp.

Olive-brown, depressed, densely punctured; head rounded and slightly narrowed in front, slightly notched in the middle of its anterior margin, angulated in front of the eyes, rounded behind, about as long as the thorax; thorax deeply excavated in front, depressed at the sides; scutellum longer than the head and thorax together, linguiform; corium of hemelytra extending beyond the end of the scutellum, the pellucid area being consequently extremely small; abdomen reddish brown, clouded with blackish; legs rather slender, testaceous, all the femora with a black internal spot: length 4 lines.

One imago, Charles Island (*W. E. Cookson*).

There is also what I believe to be an immature form of this species; but it is too little developed for accurate determination.

2. ANASA OBSCURA.

Anasa obscura, Dallas, Cat. Hemipt. p. 505.

Three examples, Galapagos Islands (*Darwin*).

The particular island is not specified.

3. NYSIUS MARGINALIS.

Nysius marginalis, Dallas, Cat. Hemipt. p. 556.

Charles and James Islands (*Darwin*).

This appears to be a common species. It is described by Stål (Eug. Resa, p. 252) as *Cymus galapagensis*; but the form of the head, with its extremely prominent eyes, seems to agree far better with *Nysius*.

4. MIRIS LINEATA, n. sp.

Form and size of *M. ruficornis*; pale flesh-colour or pinky white; femora of legs testaceous; head oblong, subconical, abruptly conical in front, about two thirds the length of the thorax; the latter widening hindwards; scutellum cordiform, nearly as long as the head; a central longitudinal well-defined carina from the front of the head to the apex of the scutellum, bordered on each side by a grey line, a grey streak also running from the back of the eyes to the hinder margin of the thorax; abdomen rose-colour, with a central longitudinal carmine line which extends to the anal extremity, and with a lateral similar line which terminates at the antipenultimate segment; hemelytra longer than the abdomen, longitudinally plicate; base of antennæ, and tibiæ of legs, hairy: length $5\frac{1}{2}$ millimetres.

Two examples, Charles Island (*Darwin*).

Mr. Darwin obtained three examples of the larval condition of what is apparently an allied species from James Island.

5. CAPSUS SPOLIATUS.

Capsus spoliatus, Walker, Cat. Hemipt. Heteropt. vi. p. 112. n. 254.

Charles and James Islands (*C. Darwin*).

6. CAPSUS NIGRITULUS.

Capsus nigritulus, Walker, Cat. Hemipt. Heteropt. vi. p. 112. n. 255.

Charles Island (*C. Darwin*).

Walker's type is quite black, but apparently not naturally so; two other examples recently obtained, but also collected by Mr. Darwin, are tawny, with bright castaneous spots on the outer margins of the hemelytra.

7. CAPSUS QUADRINOTATUS.

Capsus quadrinotatus, Walker, Cat. Hemipt. Heteropt. vi. p. 113. n. 256.

Charles and James Islands (*C. Darwin*).

Evidently a common species.

8. CAPSUS DARWINI, n. sp.

Head conical, broader than long; thorax trapezoidal, convex, nearly twice as wide behind as it is long; scutellum rectangularly triangular, slightly longer than the thorax; hemelytra considerably longer than the abdomen; antennæ about the length of the entire body. Colour testaceous, antennæ blackish towards the tips; head, thorax, and corium of hemelytra above, and the sides of pectus below, longitudinally streaked with parallel black lines; membrane with two black spots on the costa, the first at the apex of the corium, and

the other halfway between the latter and the apex of the membrane: length of body $2\frac{1}{2}$ millimetres, of entire insect with the wings closed 4 millimetres.

Three specimens, Charles Island (*C. Darwin*).

A very pretty and well-marked species.

9. MONANTHIA CYTHARINA, n. sp.

Filiform, general aspect and coloration of *M. debilitata*.

Head pyramidal, white, the central area longitudinally subcylindrical, with a central carina, reticulated with brown; thorax much wider than long, with compressed angular lateral wings, subsinuate in front, centre of anterior margin deeply excavated, three well-defined longitudinal keels, the central one straight, the two lateral ones concave; brown, with white borders and keels, the whole surface reticulated with darker brown; scutellum cordiform, brown, with darker reticulations, a central longitudinal white keel; basal half of hemelytra broad and externally strongly convex; apical area narrower and less convex; each hemelytron with a longitudinal fusiform area enclosed by a keeled margin, from the base to the middle; central area brown, with the keels and a central Λ-shaped marking white; costal borders white, with a quadrate spot near the base and several at apex dark brown; the whole surface reticulated with dark brown; legs and antennæ testaceous: length 3 millimetres.

One specimen, James Island (*C. Darwin*).

HEMIPTERA HOMOPTERA.

1. ISSUS VARIUS.

Issus varius, Walker, Cat. Homopt. ii. p. 372.

James and Charles Islands (*C. Darwin*).

2. ISSUS ROSTRIFER, n. sp.

Head conical, rostriform when viewed laterally, leaf-like above, with a marginal and a central longitudinal ridge; pronotum considerably wider than long, convex in front, concave behind, with a prominent tubercle behind the antero-interior angle of each eye; meso- and metanotum narrow, irregular, with a central longitudinal carina; scutellum triangular with sinuated sides, and narrow marginal ridge; abdomen laterally compressed, somewhat depressed at base, so that the scutellum, seen laterally, forms with the metanotum a projecting tubercle; tegmina semicircular, reticulated; colour testaceous, head above brightest in tint: length 3 millimetres.

Charles Island (*C. Darwin*).

3. DELPHAX SUBSTITUA.

Delphax substitua, Walker, Cat. Homopt. ii. p. 354. n. 21.

Charles and James Islands (*C. Darwin.*)

4. DELPHAX VICARIA.

Delphax vicaria, Walker, Cat. Homopt. ii. p. 355. n. 23.

Charles and James Islands (*C. Darwin*).

5. Delphax simulans.

Delphax simulans, Walker, Cat. Homopt. ii. p. 355. n. 24.
Charles and James Islands (*C. Darwin*).

6. Deltocephalus obliquus.

Acocephalus obliquus, Walker, Cat. Homopt. iii. p. 851. n. 23.

7. Jassus planus, n. sp.

Above sordid testaceous; pronotum in front, and head, ochraceous, the latter with a greyish spot in the centre of the ocelli; tegmina pale testaceous, hyaline; pectus and venter pale testaceous; rostrum and legs sandy yellow; eyes brown; ocelli black: head very broad, exceedingly short from the vertex hindwards, convex in front, concave behind; thorax convex in front, the sides converging, subsinuate, and ending in a truncate slightly convex line behind; scutellum triangular, all the sides slightly sinuate; tegmina extending considerably beyond the abdomen, rather narrow, distinctly convex in front; rostrum extending to the second pair of coxæ, broad and angulated at base, its basal article centrally tumid; hind tibiæ with about seven external strong spines: length of body 3 millimetres, including the tegmina $4\frac{1}{2}$ millimetres.

One example from Charles Island (*C. Darwin*).

8. Jassus lucidus, n. sp.

Shining mustard-yellow; tegmina whitish, transparent; wings white; head broad, exceedingly short from the vertex hindwards, convex in front, concave behind; thorax transverse, much broader than long, very convex in front, less so behind; scutellum triangular; tegmina extending considerably beyond the body, rather narrow, slightly convex in front; rostrum nearly as in preceding species, but narrow at base; hind tibiæ densely spined: length of body about $2\frac{1}{2}$ millimetres, including the tegmina about $3\frac{1}{2}$.

One example, James Island (*C. Darwin*).

The specimen being somewhat damaged, I have been unable to take absolutely definite measurements.

9. Jassus striolaris, n. sp.

Head testaceous, above with a central and lateral longitudinal line and a spot on each side between them, black; frons with a central line and the ocelli black; thorax black, with two central dots in front, and two U-shaped markings on the posterior half, testaceous; scutellum testaceous; tegmina black, with longitudinal testaceous veinings; body below black; legs testaceous: structure as in *I. planus*: length of body 3 millimetres, including the tegmina $4\frac{1}{2}$ millimetres.

Charles Island (*C. Darwin*).

XI. Echinodermata. By Edgar Smith.

I. Echini.

1. Cidaris thouarsii, Val.

2. Toxopneustes semituberculatus, Val.

II. Asteriidæ.

3. Heliaster microbrachia, Xantus.

III. Ophiuræ.

4. Ophiothrix spiculata, Leconte.

5. Ophionereïs albomaculata, sp. nov. (Plate XI. figs. 1–5.)

Disk somewhat pentagonal, finely scaled, the scales in the region of the radial shields larger than elsewhere; radial shields very small, narrow, pointed within, not far apart, the inner sides nearly straight, outer curved, white with the outer tips blackish; oral shields shaped like a short spear-head, the point being obtuse, and towards the mouth and the handle broad and short, the madreporic shield a little larger and of a somewhat different form; side oral shields irregularly triangular, small, situated on the sides of the orals, the outer angle touching the first very small ventral arm-plate, the lower end not nearly reaching to the apex of the oral shield; mouth-papillæ 6–8 on each mouth-angle, subequal, the outermost one generally the largest; arms about six times as long as the width of the disk, broadest about an inch from it, and towards it gradually attenuating; upper plates irregularly quadrangular, the sides converging outwardly; the outer edge is consequently narrower than the inner, and straight; the supplementary plates on each side about half as large as the central ones; lower arm-plates square, with the angles rounded; 4 spines on about the first twelve side arm-plates, 3 on the rest; the lowest is a little the smallest, the central one the largest (2 millims. in length), the uppermost broad, compressed and truncate at the apex; the single tentacle-scale is large and subcircular. The colour of the disk (in alcohol) dark olive, almost black, varied with white near the radial shields; arms above of the same dark tint as the disk, with white spots at intervals of a few segments, and towards the end of the arms the plates on each side of those which are white or which are white-spotted are almost black; lower arm-plates purplish brown, tentacle-scales a little paler; arm-spines dark olive with pale lips.

Diam. of disk 13 mill.; width of the first dorsal arm-plates including the supplementary ones 2 millims., of the fifteenth 3 millims.

Hab. Charles Island.

This species is remarkable in having the middle portion of the rays considerably broader than the base; the first lower arm-plate is very small, being only about one fourth the size of the next and situated between the side mouth-shields. The white spots on the upper surface of the arms are generally on the outer edges; but towards the end of the arms they meet, thus forming transverse white bands; and on each side of them the adjoining plates are much darker than the roots of the arms, in fact almost black, thus giving a very striking variegated aspect to them.

EXPLANATION OF THE PLATES.

PLATE XI.

Figs. 1–5. *Ophionereis albomaculata*, p. 92.
6. *Rhizochilus parvus*, p. 70.
7. *Trochus* (*Omphalius*) *cooksoni*, p. 71.
8. *Succinea bettii*, p. 72.

PLATE XII.

Fig. 1. *Leptodius cooksoni* ♂, nat. size, p. 73.
1*a*. Front, antennal, and orbital region, and buccal cavity, showing absence of palatal ridge, enlarged.
1*b*. Hand of male; enlarged, twice nat. size.
1*c*. Abdomen of male; enlarged.
1*d*. Abdomen of female; enlarged.
2. *Cubaris galapagoënsis*; enlarged, three times nat. size, p. 76.
2*a*. Lateral view in outline.
2*b*. Front of head showing antennæ; enlarged, six times nat. size.
2*c*. Terminal segment, do.

PLATE XIII.

Fig. 1. *Gasteracantha insulana*, Thorell, nat. size, p. 76.
1*a*. Profile of the same.
1*b*. Caput, with eyes, showing their position.
1*c*. Single falx, showing arrangement of teeth.
2. *Epeira cooksonii*, Butler, nat. size, p. 76.
2*a*. Profile of the same.
2*b*. Caput, with eyes.
2*c*. Single falx.
3. *Theridion carolinum*, Butler; enlarged, twice nat. size: p. 75.
3*a*. Profile of the same.
3*b*. Caput, with eyes.
4. *Thomisoides utriformis*, Butler, nat. size, p. 77.
4*a*. Single falx of the same.
4*b*. Profile.
4*c*. Caput, with eyes.
5. *Latrodectus apicalis*, Butler, profile, nat. size: p. 75.
5*a*. Single falx of the same, showing the want of teeth.
5*b*. Caput, with eyes.

7. Description of a New Species of *Lobiophasis* and a New Species of *Pitta* from the Lawas River, N.W. Borneo. By R. BOWDLER SHARPE, F.L.S., F.Z.S., &c., Senior Assistant, Zoological Department, British Museum.

[Received February 6, 1877.]

When my friend Mr. Ussher was appointed Governor of Labuan, the first thing that I naturally asked him, was to try and get additional specimens of the *Lobiophasis bulweri*. I have received several letters from him, announcing the successive failures of his attempts to obtain more examples of this bird; but at last I heard from him that, although the collector whom he had sent to the Lawas river had not met with the longed for Pheasant, he had procured a pair of an apparently new species, which I might expect to see before long.

On the arrival of the specimens, I perceived at once several indications of the novelty of the Pheasant; and on showing them to Dr. Sclater and Mr. Gould, they agree with me that we have in these birds a second species of the genus *Lobiophasis*, which I propose to call

LOBIOPHASIS CASTANEICAUDATUS, sp. n.

♂. L. *similis* L. bulweri *sed paullo major, pileo plumifero et cauda castanea distinguendus: long. tot.* 22, *culm.* 1·6, *alæ* 11·0, *caudæ* 7·5, *tarsi* 3·35.

♀. *Ochracescenti-brunnea, plumis omnibus nigro vermiculatim undulatis: pileo vix cristato: collo undique pallide ochracescenti-fulvo, concolori: gula pallide fulva: corpore reliquo subtus rufescenti-ochraceo, obscure fusco vermiculato, abdomine imo cinerascenti lavato: remigibus nigro et ochraceo extus distincte vermiculatis, secundariis rufescentibus, minutius undulatis: cauda saturate castanea, obscure nigro vermiculata: long. tot.* 20, *culm.* 1·6, *alæ* 9·85, *caudæ* 7·6, *tarsi* 2·6.

Hab. Borneo, in ripis fluminis "Lawas" dicti.

The chestnut tail of this bird, which is evidently quite adult, seems to suggest the impossibility of its being the same as *L. bulweri*; and it is to be noted that the Malay hunter who procured both the original specimen of Bulwer's Pheasant and the present species did not imagine that the two birds could be the same. I must confess that the smaller size of the wattles and the plumed head induced me to consider this new bird as being probably *L. bulweri* in an intermediate stage, perhaps in the second year. No such difference, however, in the plumage of any Pheasant is known as yet; and after consulting with the eminent authorities above mentioned, I have ventured to describe it as distinct.

Along with this Pheasant Governor Ussher sent a *Pitta*, which is undoubtedly new to science, and which I designate as

PITTA USSHERI, sp. n.

P. *similis* P. venustæ *sed colore nigro purpureo lavato, pileo, facie laterali et gutture nigris distinguendus: pectore summo nigro purpureo lavato: long. tot.* 6·8, *culm.* 0·85, *wing* 3·54, *tail* 1·3, *tarsus* 1·6.

Hab. Lawas river, N.W. Borneo.

The differences between *P. ussheri* and *P. venusta* consist in the much richer coloration of the former. Thus, where *P. venusta* is brown with a reddish gloss, *P. ussheri* is black with a purple lustre; the top of the head, sides of face, and throat are entirely black. In *P. venusta* the edges to the wing-coverts are cobalt, but are not very distinct, whereas in *P. ussheri* they are extremely broad and very brilliant, while the secondaries are also shaded with blue.

February 20, 1877.

Professor Flower, F.R.S., V.P., in the Chair.

A communication was read from Professor Owen, C.B., F.R.S., containing an account of the additional evidence recently obtained as to the occurrence of extinct gigantic birds of the unwinged group allied to *Dromornis* in Australia. The specimens upon which Prof. Owen's remarks were based consisted of a pelvis obtained by Mr. W. B. Clarke from what is termed locally the "Canadian lead," at a depth of from 150 to 200 feet, in the county of Phillip, New South Wales, and of a mutilated left tibia, stated to have been found in a cave in Mount Gambier, South Australia.

This paper will be published in the Society's 'Transactions.'

Mr. Osbert Salvin, F.R.S., exhibited a volume of original drawings taken by Mr. George Raper during the voyage of Capt. Hunter to Australia in 1788–92, and made the following remarks:—

"Though the north-eastern side of New Ireland was discovered as early as 1616 by Le Maire and Schouten[1], and the passage between New Britain and New Guinea by Dampier in 1700, it was not until September 1767 that the channel between New Britain and New Ireland was discovered by Carteret[2], and named by him St. George's Channel.

"From him and from Dampier most of the salient geographical features of the immediate district received names, including the Duke-of-York Island, which lies in St. George's Channel. Carteret, however, though he seems to have carefully examined the southern end of New Ireland, did not attempt to land on Duke-of-York Island, but passed to the eastward of it. Captain John Hunter, when in command of the transport 'Waaksambeyd,' one of the ships which conveyed the first convicts to Botany Bay and Norfolk Island under Governor Phillip, appears to have been the first person actually to visit this island, and in his 'Historical Journal,' chap. ix.[3], gives a full account of the doings of himself and his ship's company there, as well as a description of the vegetation and scenery of it and the adjoining islands.

"With reference to this voyage I now exhibit some water-colour sketches which have recently come into Mr. Godman's and my possession, and which were made by one George Raper, who was evidently in the ship with Capt. Hunter. In them are depicted scenes connected with the voyage of the 'Sirius' and 'Supply,' the two vessels which conveyed the first convicts to Australia; and with them are views of Port Jackson, Norfolk Island (then covered with pines),

[1] 'Directions for the Pacific Ocean,' by A. G. Findlay, part ii.

[2] Hawkesworth's 'Voyages,' i. p. 595.

[3] 'Historical Journal of the Transactions at Port Jackson and Norfolk Island, with the discoveries which have been made in New South Wales and in the Southern Ocean since the publication of Phillip's Voyage,' &c. 4to: London: 1793.

and other places, as well as several objects of natural history, including the white Gallinule (*Fulica alba*) of Lord Howe's Island. One of these drawings represents "Port Hunter," Duke-of-York Island, and, no doubt, gives a fair idea of the island as it then existed.

"Several of the French expeditions visited these islands. De Bougainville[1] in 1768, the year after Carteret's discoveries, spent some days at the southern end of New Ireland, and named the small cove at the eastern end of Gowan's Harbour 'Port Praslin.' This spot was afterwards visited by Duperrey in the 'Coquille' in 1823; and here the only entomological collections which have hitherto reached Europe from this island were made. These were described in the Zoology of the Voyage of the 'Coquille' by Guérin-Méneville; and several of the butterflies are figured in the atlas of that work.

"The different explorers who have visited these islands seem to have been variously impressed with them, according, perhaps, to the season of the year when they were there. All, however, extol the richness of the verdure, the extent of the forests, as well as the grandeur of the scenery of both New Britain and New Ireland; but the climate is very humid, and the rainfall at times excessive."

The following papers were read:—

1. On the Birds collected by Mr. George Brown, C.M.Z.S., on Duke-of-York Island, and on the adjoining parts of New Ireland and New Britain. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received February 19, 1877.]

(Plates XIV.–XVI.)

I am now in a position to give the Society a better account of the collection of Birds made by our Corresponding Member, Mr. George Brown, in Duke-of-York Island and on the adjacent portions of New Ireland and New Britain, which I exhibited at our second meeting in January last[2]. Before, however, I do this, I will make a few preliminary remarks, to serve as an introduction to this and the papers to follow, which some of my friends have been kind enough to prepare, on other branches of Mr. Brown's collections.

For my first introduction to Mr. Brown, I am indebted to Dr. F. Müller, the well-known botanist, of Melbourne, who wrote to me in 1874 pointing out Mr. Brown's enthusiastic love for natural history, and recommending his election as a Corresponding Member of the Society. Mr. Brown was at that time attached to the Wesleyan Mission in the Samoan group, but shortly afterwards returned to Sydney, and was sent out as the leader of a new Wesleyan Mission at Port Hunter, Duke-of-York Island. Mr. Brown left Sydney in

[1] 'A Voyage round the World,' by Lewis de Bougainville, translated by John Reinhold Forster. 4to: London, 1773.

[2] See above, p. 28.



J. Smit del & lith.

M&N Hanhart imp

Fig 1. MONARCHA VERTICALIS.
2. DICŒUM EXIMIUM.

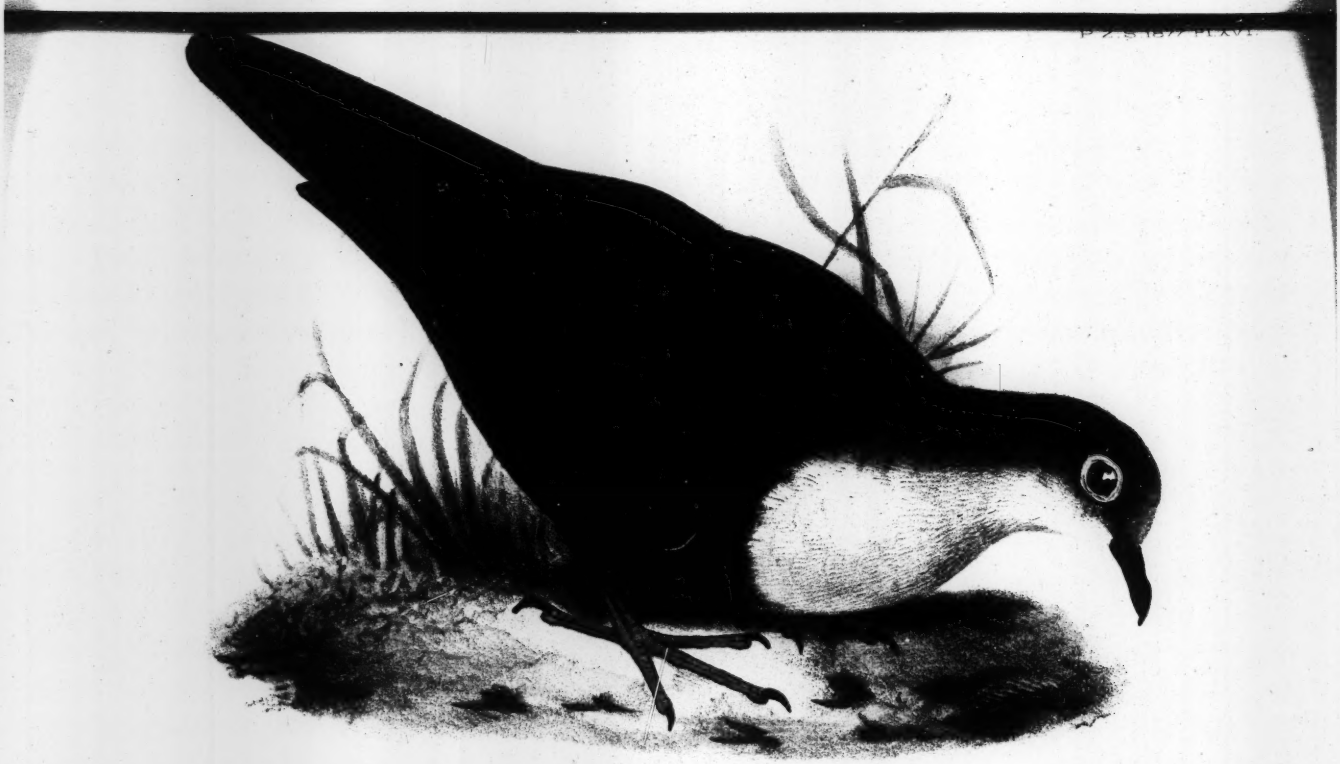




4/5

J. Smit del. et lith. M&N Hanhart imp

ARTAMUS INSIGNIS.



J. Smit lith

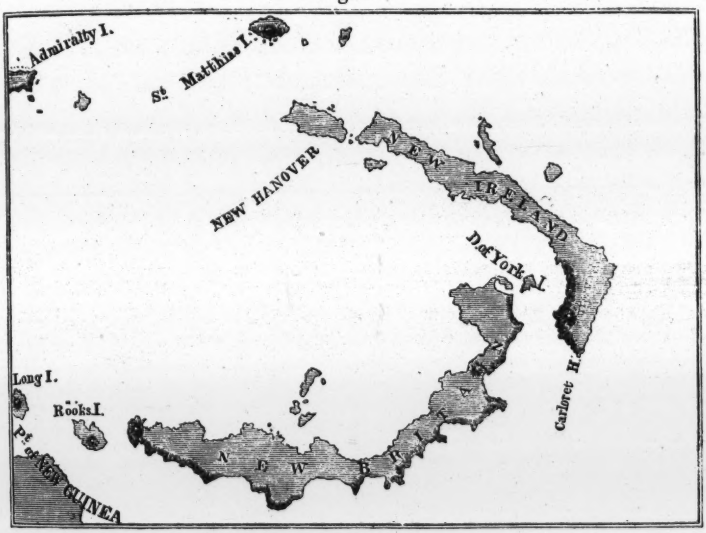
M&N Hanhart imp.

PHLOGŒNAS JOHANNÆ



April 1875 in the 'John Wesley,' and, after a visit to several mission-stations, arrived at Port Hunter in the August following. Here he at once proceeded to collect living specimens for the Society, and in September 1875 wrote to me announcing the dispatch to Sydney[1] of a number of birds, of which, I regret to say, only the Cassowaries eventually reached us alive[2]. In replying to Mr. Brown, I took the opportunity of pointing out to him the very interesting nature of the locality in which he was resident, and of assuring him that I would do my best to see that any zoological specimens that he might be able to collect there were properly worked out, and that due credit was given to him.

Fig. 1.



Outline Map of Duke-of-York Island, New Britain, and New Ireland, from the Admiralty Chart.

Mr. Brown returned to Sydney in October last, bringing with him the collection which we have before us this evening, in making which he had, I believe, the assistance of Mr. Cockerell, a young Australian naturalist and collector. Mr. Brown's letters, however, do not contain details upon the manner, nor, I regret to say in many cases, upon the exact localities in which his specimens were obtained; but I gather

[1] See extract from his letter, P. Z. S. 1875, p. 2.

[2] See P. Z. S. 1876, p. 413, where these birds are determined as *Casuarius bennetti*. But until these birds are adult this determination must be considered provisional only.

from his correspondence, and from notices in several newspapers and journals[1], that Mr. Brown's head quarters during the year which he passed in this district were Port Hunter, Duke-of-York Island, where is the Wesleyan Church and Mission, and that frequent excursions were made thence to the adjoining large islands of New Britain and New Ireland. Writing on February 4th, 1876, he speaks of having been seven times over to New Ireland in three months, and of there being missionary stations at Nodup and Matupi in New Britain, both occupied by native teachers. It may be assumed, therefore, that Mr. Brown's collections were formed on those parts of the islands of New Britain and New Ireland which are nearest to Duke-of-York Island[2], as shown in the accompanying outline chart (p. 97).

The collection of birds which Mr. Brown has transmitted to me for determination consists of 89 skins, belonging to 70 species, of which 10 appear to be new to science, as shown in the subjoined Table.

	Skins.	Species.	New to Science.
I. Passeres	25	20	5
II. Coccyges	16	13	1
III. Psittaci	10	8	1
IV. Striges	1	1	1
V. Accipitres	5	4	
VI. Herodiones	3	2	
VII. Columbæ	20	13	2
VIII. Gallinæ	1	1	
IX. Fulicariæ	1	1	
X. Limicolæ	5	5	
XI. Gaviæ	2	2	
	89	70	10

The following is a detailed account of them[3]:—

1. Cisticola ruficeps, Gould, B. Austr. iii. pl. 45 (?).

Apparently a worn specimen of this species, which Mr. Sharpe

[1] See Wesleyan Missionary Notices for Feb. 1876, p. 28, and Jan. 1877, p. 17.

[2] Since this paper was read I find that Mr. Brown has sent a communication to the Royal Geographical Society on his expedition to Duke-of-York Island. It appears from this memoir (which, through Mr. Bates's kindness, I have had the opportunity of reading in MS.) that Duke-of-York Island is not, as is marked on the chart, one island, but a group of twelve islands, of which seven are inhabited. Mr. Brown states that he examined about 130 miles of the coast of New Ireland, from Cape Bougainville northward, and crossed the island from west to east, at a point N.N.E. of Duke-of-York Island. On New Britain Mr. Brown examined the coast from Cape Orford and Spacious Bay to Cape Palliser on the west, and thence round Blanche Bay, and as far as Port Weber at the head of a deep bay about 20 miles east of Cape Lambert. The collections sent were therefore, we may presume, all made within these limits.—P. L. S.

[3] Prof. Salvadori, to whom I transmitted Mr. Brown's collection for examination, has most kindly furnished me with some notes on the specimens, of which, at his request, I have not hesitated to make use.

tells me occurred also in Mr. Stone's collection from the south of New Guinea. The exact locality is not given.

2. Pitta mackloti, Müll. & Schl.

One example, New Britain, Feb. 1876.

I was at first inclined to separate this *Pitta* from *P. mackloti*, on account of its having a blue line on the crown, as in *P. celebensis*; but Prof. Salvadori assures me that "some specimens from Batanta, Waigiou, and Andai have this mark equally conspicuous." The occurrence of a *Pitta* in New Britain is a fact of great interest.

3. Sauloprocta melaleuca (Quoy et Gaim.).

Muscipeta melaleuca, Quoy et Gaim. Voy. de l'Astrol. i. p. 180, t. 4. f. 3.

Sauloprocta melanoleuca, Cab. Mus. Ornith. Hein. p. 57.

Sauloprocta melaleuca, Scl. P. Z. S. 1869, p. 119.

Sauloprocta tricolor, Salvad. et D'Alb. Ann. Mus. Civ. Gen. vii. p. 23.

The locality of Mr. Brown's specimen is not marked; but the species was first obtained in New Ireland. It is also found in the Solomon Islands and New Guinea. Whether *Muscipeta tricolor*, Vieillot, ex Timor (*Maugé*), is identical must remain uncertain until specimens from that island have been compared. Wallace does not include the species in his Birds of Timor (P. Z. S. 1863, p. 485).

4. Rhipidura setosa.

Muscipeta setosa, Quoy et Gaim. Voy. de l'Astrol. i. p. 181, t. 4. f. 4 (1830).

Rhipidura setosa, G. R. Gray, Gen. B. i. p. 259, et Cat. B. Trop. Isl. p. 17.

Rhipidura gularis, Müller et Schl. Verh. Ethn. p. 185 (1839–44).

One skin of this species, being from Duke-of-York Island, is, no doubt, the true *R. setosa*, originally described from New Ireland; but I suspect it is also scarcely different from *R. gularis* of New Guinea, and that these two species will have ultimately to be united. *Cf.* Meyer, Sitz. Ak. Wien, lxix. p. 503.

5. Monarcha verticalis, sp. nov. (Plate XIV. fig. 1.)

Super ater: uropygio, primariorum tectricibus mediis et secundariorum omnibus albis: frontis, faciei, regionis ocularis, et gutturis totius plumis nigris, exstantibus, quasi squamosis, fascia verticali alba ex similibus plumis composita: abdomine et subalaribus albis: rostro et pedibus nigris: rictu setis rigidis munito: long. tota 6·0, *alæ* 3·3, *caudæ* 2·11.

Hab. Duke-of-York Island (Oct. 1875).

Obs. Sp. *Monarchæ loricatæ*, Wall. (P. Z. S. 1863, p. 29, pl. vi.),

affinis, sed cauda nigra, uropygio et macula verticali albis dignoscenda.

6. MONARCHA CHRYSOMELAS.

Muscicapa chrysomela, Garn. Voy. de la Coq. Zool. i. p. 594, Atl. t. 18. f. 2.

Monarcha chrysomela, Sw. Class. B. ii. p. 257.

Monarcha cordensis, Cab. et Reich. Journ. f. Orn. 1876, p. 320 (?).

The locality for this species given in the text of the 'Voyage of the Coquille' is New Zealand; that given on the plate is New Ireland, which is, no doubt, correct.

The New-Guinea bird commonly assigned to this species is conspicuously different, having the greater part of the back black. I propose to call it *Monarcha melanonotus*[1]. On the other hand, the form from Kordo, which Meyer has recently named *M. kordensis* (Sitz. Ak. Wien, lxix. p. 252), comes near the typical *M. chrysomelas*, but has the black colour rather wider on the back, and extending further down on the throat. In *M. kordensis* also, the black colour narrowly surrounds the eye, which is not the case in *M. chrysomelas*.

M. chrysomelas is sometimes referred to the genus *Arses* of Lesson; but the first species in Lesson's list (Traité d'Orn. p. 387), which I suppose must be regarded as the type, is *Arses telescophthalma*, which certainly belongs to a different form. I may also remark that *Arses kaupi* of Australia being little more than a representative form of *A. telescophthalma*, the institution of a separate genus (*Ophryzone*) for the former, as has been proposed by Mr. Ramsay (P. Z. S. 1868, p. 383), is unnecessary, and that *Ophryzone*=*Arses*.

7. MONARCHA ALECTO.

Drymophila alecto, Temm. Pl. Col. 430. fig. 1 (♂).

Monarcha alecto, Meyer, Sitz. Ak. Wien, lxix. p. 504.

Muscicapa chalybeocephalus, Garn. Voy. de la Coq. Zool. i. p. 589, Atl. t. 15. f. 2 (♀).

Monarcha chalybeocephalus, Salvad. Ann. Mus. Genova, vii. p. 768.

Piezorhynchus nitidus, Gould, B. Austr. ii. pl. 88.

New Ireland is the original locality of Garnot's *Muscicapa chalybeocephalus*; and Mr. Brown sends us a pair of birds from Duke-of-York Island, collected in October 1875, the female of which quite agrees with Garnot's figure and description.

I have compared them with a series of *Piezorhynchus nitidus* from Cape York, collected by Mr. Cockerell, and now in Mr. Godman's collection, and can find no tangible differences.

I have also examined skins of the same bird from New Guinea, and am quite inclined to agree with Dr. Salvadori's views (*l. s. c.*) as to its range and synonyms. Dr. Meyer seems to have arrived at

[1] The form from Aru, *M. aruensis*, Salv. (Ann. Mus. Civ. Genoa, vi. p. 309), appears to have the back as black as the Papuan form.

nearly the same results, and I use the name *alecto*; which he adopts, for the reasons which he gives.

8. Artamus insignis, sp. nov. (Plate XV.)

Candidus: capite cum cervice undique, alis et cauda nigerrimis: remigum et rectricum pagina inferiore cinerascea; subalaribus albis: rostro cæruleo, pedibus fuscis: long. tota 7·7, *alæ* 5·8, *caudæ* 2·5.

Hab. New Ireland (March 1876).

Obs. Diversus ab *A. monacho* capite alis et cauda nigris.

Here is a second instance of a repetition on the further side of New Guinea of a Celebesian type, *A. monachus* of Celebes being certainly the nearest known ally of this fine new species.

I have examined a specimen of *A. melaleucus* (Forst.) of New Caledonia in the British Museum, but find it quite distinct, having the upper back black. *A. maximus*, Meyer, of New Guinea, is of the same large size as the present bird, but has the whole back black.

9. Graucalus papuensis (Gm.).

I refer a single skin without exact locality to the wide-ranging *Graucalus papuensis*, as understood by Salvadori (Ann. Mus. Gen. vii. p. 771) and Meyer (Sitz. Ak. Wien, lxix. p. 505).

10. Edoliosoma, sp. inc. (♀).

A single skin, without exact locality, belongs to a female of one of the species of this genus—perhaps *E. muelleri*, Salvad. (= *plumbeum*, Müll. nec Wagler). A very nearly similar skin in the British Museum is marked *E. schisticeps* (G. R. Gray).

11. Lalage karu.

Ceblepyris karu, Less. Voy. Coq. Zool. p. 633, Atl. t. xii.

Lalage karu, Salvad. Ann. Mus. Gen. ix. p. 28.

A male of this species from Duke-of-York Island (Oct. 1875). It was originally established on specimens from New Ireland.

12. Dicranostreptus megarhynchus.

Edolius megarhynchus, Quoy et Gaim. Voy. Astrol. Zool. i. p. 184, Atl. t. 6.

Dicrurus megarhynchus, Scl. P. Z. S. 1869, p. 119.

A skin of this fine species, from New Ireland, which is, I believe, its true *patria*. Quoy and Gaimard say Havre Dorey, New Guinea; but this is in all probability an error, as subsequent collectors have not obtained it in New Guinea.

The specimen in the British Museum is likewise from New Ireland, obtained in Carteret Harbour by Capt. Lambrick, R.N.

13. Dicrurus læmo-stictus, sp. nov.

Nigerrimus: alis caudaque extus æneo nitentibus: capitis, cervicis undique et pectoris antici plumis nitente æneo maculatis, his

maculis in gutture et in pectore rotundis, distinctis: habitu generali D. carbonarii: *long. tota* 11·3, *alæ* 6, *caudæ rectr. ext.* 5·4, *med.* 4·6.

Hab. New Britain (October 1875).

This Drongo, of which there is one skin in Mr. Brown's collection, obtained in New Britain in October 1875, belongs strictly to the same group as *D. carbonarius* of New Guinea and *D. bracteatus* of Australia. I should have been rather inclined to refer it to the former species; but as Mr. Sharpe, who has lately been engaged on this difficult family, points out to me, if *D. pectoralis*[1] of the Sula Islands is to be considered distinct, then this bird must also be allowed equal rank; for in it the round feather-spots on the breast are quite as large and well-marked as in *D. pectoralis*, and extend moreover over the throat.

This appears to be another case of the recurrence of Celebesian forms to the east of New Guinea.

14. Dicæum eximium, sp. nov. (Plate XIV. fig. 2.)

Supra saturate æneo-viride, pileo et capitis lateribus brunnescentibus: uropygio coccineo: subtus album, fascia pectorali angusta coccinea: lateribus et ventre medio fuscescenti-schistaceis, hypochondriis sicut dorso æneis: subalaribus albis: rostro et pedibus nigris: long. tota 3·3, *alæ* 2·0, *caudæ* 1·0.

Hab. New Ireland (March 1876).

This *Dicæum* is quite distinct from any species known to me. It is just possible that *D. æneum* of the 'Voyage au Pôle Sud' may be the female of it.

15. Nectarinia aspasia.

Cinnyris aspasia, Less. Voy. Coq. Zool. i. p. 676, Atl. t. 30. fig. 4.

Three skins (♂, ♂ gr. et ♀) of this Sun-bird from Duke-of-York Island. Mr. Shelley, who is now monographing this beautiful group of birds, kindly sends me the subjoined remarks on them:—

"It is most interesting to find the true *C. aspasia* from Duke-of-York Island. Previously this bird was known to be a native of at least two thirds of the northern portion of New Guinea, and to extend westward to the islands of Popo and Mysol. The specimens from Popo island have a slightly more lilac tinge to the throat, but are not sufficiently distinct in my opinion for specific separation. Lesson's type of *C. aspasia* came from Havre Dorey; and specimens received thence agree in every respect with the adult male from Duke-of-York Island, which may be thus described. General plumage blue black; forehead, crown and nape metallic green; least and median series of wing-coverts, the scapulars, the lower half of the back, the upper tail-coverts, and the edges of the tail-feathers metallic green, faintly shaded with steel-blue, in that respect contrasting with the colour of the crown, which is rather golden than blue-green; beneath, chin and throat steel-blue, very faintly shaded with lilac.

[1] Wallace, P. Z. S. 1862, p. 342.

"This short description of the plumage is quite sufficient to show that the New-Ireland bird is truly *C. aspasia*; the rather more golden shade of the crown is certainly too slight to be of any importance. The steel-blue throat is so faintly shaded with lilac that it shows its affinities to be rather with the Dorey type than with the Popo bird.

"I shall now give the measurements, that they may be compared with two specimens, one from Dorey, and one from Mysol, in the British Museum.

	Length. in.	Culmen. in.	Wing. in.	Tail. in.	Tarsus. in.
New Ireland	4·2	0·65	2·35	1·7	0·65
Dorey	4·2	0·65	2·4	1·5	0·55
Mysol	4·0	0·70	2·4	1·5	0·60

"The adult female from Duke-of-York Island has the breast bright sulphur-yellow, barely tinted with olive towards the front of the chest, and the under tail-coverts slightly paler. The throat is ashy tinted white. The upper part of the head and back of the neck ash-grey, the back and the edges of the wing-feathers olive-yellow, the black tail with the white tips to some of the outer feathers, are characters agreeing perfectly with the other females I have seen of this species. The paler and brighter underparts are apparently only due to the skin having been less exposed to the blackening influence of the London atmosphere.

"The young male, or, perhaps, more properly the male in moult resembles the female, excepting that the sides of the throat and a few of the middle feathers are steel-blue, and on the front of the chest there are a few black feathers, the first signs of the coming adult plumage.

"In Mr. Godman's collection there are two specimens of this bird, said to have been obtained at Cape York, Australia. This extension of the range so far south as Australia appeared somewhat improbable for a member of the '*Hermotimia*' group, considering how extremely limited is the range of all the other species of this group.

"This species, however, was known to be the most widely spread of the '*Hermotimia*' group and now that we find that it extends so far eastward as Duke-of-York Island, we have little reason to doubt its extending also southward to Cape York; and on examination of the two specimens in Mr. Godman's cabinet, it will be seen that the Cape-York specimens have the violet shade on the throat, indicative of the western form of this species as found at Popo and Mysol, but agree in the colouring of the crown with the true *C. aspasia* from Dorey, and not with the type specimen of *Hermotimia chlorocephala*, Salvadori, from the Aru Islands."

16. NECTARINIA FRENATA.

Nectarinia frenata, Müll. Verh. Zool. p. 61, pl. 8. fig. 1.

Nectarinia flavigastra, Gould, P. Z. S. 1843, p. 104; Zool. Sulph. p. 43, pl. 24 (♀).

Nectarinia australis, Gould, B. Austr. Suppl. pl. 45.

Mr. Brown sends me from New Ireland an adult male and female of this species. This is very interesting; for the female of the New-Ireland bird was described and figured by Mr. Gould in 1844, under the title of *Nectarinia flavigastra*. There can be no doubt, Capt. Shelley tells me, of the identity of the New-Ireland bird with *N. frenata*, which has the following wide range—Celebes, Moluccas, New Guinea, New Ireland, islands of Torres Straits and North-eastern Australia. This bird will be figured in Capt. Shelley's 'Monograph of the Cinnyridæ,' part 3.

17. PHILEMON COCKERELLI, sp. nov.

Supra fuscus unicolor, pileo et capitis lateribus paulo obscurioribus: subtus dilutior, fusco-cinereus, gutture albicantiore et striis angustis plumarum scapas occupantibus instructo: fronte, loris, oculorum ambitu et mandibula inferiore usque ad aures denudatis: plumis auricularibus dorso concoloribus: rostri tuberculo nullo: rostro obscure corneo, pedibus albicanti-plumbeis: long. tota 13·0, *alæ* 6·0, *caudæ* 5·0, *tarsi* 1·7.

Hab. New Britain (Feb. 1876).

Obs. Similis *P. moluccensi*, sed pileo obscuriore, dorso omnino concolori dignoscendus; a *P. fuscicapillo* colore corporis inferioris dilutiore diversus.

I have already pointed out (P. Z. S. 1869, p. 120) the necessity of using *Philemon* as the name of this genus.

18. CALORNIS NITIDA.

Calornis nitida, G. R. Gray, P. Z. S. 1858, p. 181.

Lamprotornis metallicus, Garn. Voy. de la Coq. Zool. i. p. 343.

Calornis metallica, Scl. P. Z. S. 1869, p. 120.

A pair of this species from Duke-of-York Island. The male agrees with Mr. Gray's type, collected during the voyage of the 'Sulphur' in New Ireland. Whether it be really separable from *C. metallica*, I must leave the monographer to decide.

19. GRACULA KREFFTI.

Gracula kreffti, Scl. P. Z. S. 1869, p. 120, pl. ix.

Gracula gnathoptila, Cab. et Reich. Journ. f. Orn. 1876, p. 322.

My original example of this species having been received in spirit, the yellow colour of the belly was much faded, and the absence of the naked jaw-stripe (which occurs in *G. dumonti*) was not noted.

Both these characters are well developed in the present example from New Ireland; and I have no doubt that the New-Hanover bird, which has been recently termed *G. gnathoptila*, is of the same species.

20. CORVUS, sp. inc.

A single skin of a Crow from New Britain, which Mr. Sharpe,

now engaged on the genus, is inclined to refer to *C. enca*[1], but Prof. Salvadori to a smaller form of *C. orru*. If the former view be correct, this would be again a reappearance of a Celebesian form.

21. DENDROCHELIDON MYSTACEA.

Cypselus mystaceus, Less. Voy. Coq. Zool. i. p. 647, Atl. t. 22. *Dendrochelidon mystaceus*, Gould, B. Asia, pt. xi.

One male specimen, without exact locality.

22. ALCEDO MOLUCCENSIS, Blyth; Sharpe, Kingf. p. 21, pl. 4. *Alcedo ispida*, var. *moluccana*, Less. Voy. Coq. Zool. i. p. 343.

One skin, without exact locality; but Lesson obtained the species in New Ireland.

23. CEYX SOLITARIA, Temm.; Sharpe, Kingf. p. 115, pl. 38.

One skin, without exact locality.

24. HALCYON ALBICILLA (Dumont); Sharpe, Kingf. p. 197, pl. 73.

One skin, without exact locality.

25. HALCYON CHLORIS (Bodd.); Sharpe, Kingf. p. 229, pl. 87.

One skin, without exact locality.

26. HALCYON SANCTUS, Vig. et Horsf.; Sharpe, Kingf. p. 239 pl. 91.

One skin, from Duke-of-York Island, Oct. 1875.

27. TANYSIPTERA NIGRICEPS, sp. nov.

Supra nigra, plaga interscapulari magna et uropygio albis: alis nigris extus cæruleis: caudæ rectricibus lateralibus nigris cæruleo marginatis, medianis elongatis albis in margine externo limbo cæruleo ornatis, duabus quoque proximis in margine interno albis: subtus omnino cinnamomea unicolor: rostro coccineo; pedibus fuscis: long. tota 11·5, *alæ* 3·6, *caudæ rectr. med.* 6·8, *ext.* 2·1.

Hab. Duke of York Island (Oct. 1875).

Obs. Species distinctissima, *T. sylviæ* proxima, sed pileo nigro insignis.

28. MEROPS ORNATUS, Lath.; Gould, B. Austr. ii. pl. 16.

A young bird of this Bee-eater from Duke-of-York Island. I have also a skin from New Britain, obtained from Mr. Krefft in 1869 along with the birds from the Solomon Islands.

[1] Mr. Sharpe writes: "Your Crow is nearest to *C. enca*. There are three races of this form:—

"1. *C. enca*: wing 10·8–12·5, tarsus 1·9–2·1.

"2. *C. orru*: wing 12·5–13·1, tarsus 2·15–2·3.

"3. *C. violaceus*: wing 9·5–9·8, tarsus 1·65–1·75.

"Your bird measures 11·45, tarsus 1·9. It indicates a Celebesian affinity again."

29. EURYSTOMUS CRASSIROSTRIS, Sclater, P. Z. S. 1869, p. 121.

One skin, agreeing with the type from the Solomon Islands, is marked female, but has no exact locality indicated.

30. CENTROPUS ATERALBUS.

Centropus ateralbus, Less. Voy. Coq. Zool. i. p. 620, Atl. t. 34; Scl. P. Z. S. 1869, p. 122.

A skin of this Coucal is labelled "New Britain and New Ireland," the collector having, I suppose, found it in both these islands. It has the whole head white, except a few frontal feathers, and a white patch on each flank. But I am not disposed to regard the differences from Lesson's figure as more than individual.

31. CENTROPUS VIOLACEUS.

Centropus violaceus, Quoy & Gaim. Voy. de l'Astrol. Zool. i. p. 229, t. 19.

One skin of this fine species, from New Britain, marked "male." Quoy and Gaimard obtained it in New Ireland. The total length of the present specimen is about 25·0 in., wing 9·5, tail 14·0. The bill is black, the feet apparently whitish or pale yellow. Dr. Meyer's *Nesocentor violaceus*[1], from Mysore, has been recently separated by Salvadori as *N. chalybeus* (Ann. Mus. Gen. vii. p. 915).

32. CACOMANTIS INSPERATUS.

Cuculus insperatus, Gould, P. Z. S. 1845, p. 19, et B. Austr. iv. pl. 87.

Cuculus assimilis, Gray, P. Z. S. 1858, p. 184 (?).

Cacomantis insperatus, Gould, Hand-b. B. Austr. i. p. 619.

Cuculus dumetorum, Gould, P. Z. S. 1845, p. 19 (?).

One example from Duke-of-York Island, one from New Britain, and a third with locality not marked. These skins seem to agree sufficiently with Gould's figure.

I have compared them with three Australian skins in the collection of Mr. Godman, obtained from Cockerell; and I consider them referable to the same species. Two of Mr. Godman's skins are marked "*C. dumetorum*," and a third (younger) bird "*C. insperatus*."

33. EUDYNAMIS PICATUS.

Cuculus rufiventer, Less. Voy. Coq. Zool. i. p. 622.

Eudynamis rufiventer, Walden, Ibis, 1869, p. 344.

Eudynamis picatus, Müll. Verh. Ethn. p. 176; Cab. et Heine, Mus. Hein. ii. p. 55.

A pair of the Black *Eudynamis*, which must, I suppose, be referred to this form of *E. orientalis*. They measure:— ♂, total length 17 inches, wing 8·1, tail 8·8; ♀, total length 15·5 inches, wing 8, tail 8.

The *exact* locality is not given.

34. ECLECTUS POLYCHLORUS (Scop.).

From Duke-of-York Island Mr. Brown sends two skins of what,

[1] Mitth. zool. Mus. Dresden, pt. i. p. 16 (1875).

according to recent discoveries[1], must, I suppose, be regarded as a *pair* of this species. But it is only right to say that Mr. Brown does not share in the view that *E. linnæi* is the female of *E. polychlorus*. He writes:—"By the by, I hear that many naturalists maintain that the Green Parrot (see specimens) is the adult male, and the red one the female or young bird of the same species. This is a gross error. Our attention was directed to this, and I am quite sure that they are two different birds. We shot the green ones, both male and female."

35. GEOFFROIUS CYANICEPS.

Piones heteroclitus ♀, Hombr. et Jacq. Voy. au P. S. Atl. t. 25 bis, fig. 2.
Pionus cyaniceps, Puch. ibid. Zool. iii. p. 105.
Geoffroius heteroclitus, Scl. P. Z. S. 1869, p. 122.

A skin from New Britain (Feb. 1876) agrees sufficiently with the two specimens from the Solomon Islands which I have referred to the female of this species on Dr. Finsch's authority. But I am now rather of opinion that Dr. Pucheran was probably correct in considering the so-called female of Hombron and Jacquinot a distinct species.

My specimens have no yellow at all on the cheeks; but the whole head is pale brown, with a cyaneous tinge.

36. LORICULUS TENER, sp. nov.

Fem. *Clare viridis fere unicolor, uropygio et caudæ tectricibus superioribus flavicantibus: macula gutturali rubra: remigibus et rectricibus nigris, extus dorso concoloribus, in pagina inferiore læte cæruleis: rectricum ipsis apicibus flavicantibus: rostro nigro: pedibus fuscis: long. tot.* 3·8, *alæ* 2·7, *caudæ* 1·2.
Hab. Duke-of-York Island (Nov. 1875).

Unfortunately there is only a single example of this diminutive *Loriculus* in the collection. It would seem to be nearest to *L. aurantiifrons* of Schlegel (Ned. Tijdschr. iv. p. 9), but has not the red rump, which, so far as I can tell from Schlegel's description, is present in both sexes of that species[2].

Salvadori (Ann. Mus. Civ. Gen. vii. p. 912) and Meyer (Sitzungsb. Isis, 1875, p. 78) both record the occurrence of *L. aurantiifrons* in New Guinea, it having been originally described from Mysol. It is the only species of the genus yet known to be found there.

37. CACATUA OPHTHALMICA.

Cacatua ducorpsi, Scl. P. Z. S. 1862, p. 141, pl. xiv. (err.).
Cacatua ophthalmica, Scl. P. Z. S. 1864, p. 188.
Plictolophus ophthalmicus, Finsch, Papag. i. p. 282.

[1] *Cf.* Salvadori, Ann. Mus. Genova, vii. p. 756.

[2] P.S. (March 26th).—Dr. Salvadori has now most kindly lent me a female of *L. aurantiifrons* from Andai, New Guinea, for comparison. It *has* the rump and upper tail-coverts scarlet instead of yellow, and is not generally of so bright a green as my bird, which is otherwise very similar in size and colour.—P. L. S.

A single skin of this Cockatoo has no exact locality affixed to it. It measures—whole length 17·5 inches, wing 11·5, tail 6·8.

38. NASITERNA PUSIO.

Nasiterna pusio, Scl. P. Z. S. 1865, p. 620, pl. xxxv.

The single skin of this species agrees well with the typical specimen, which I presented to the British Museum after describing it. The exact locality is not marked.

39. LORIUS HYPŒNOCHROUS.

Lorius hypoinochrous, Gray, List of Psitt. p. 49 (1859).
Lorius hypœnochrous, Scl. P. Z. S. 1869, p. 123, et 1876, p. 460.

One skin, marked "New Britain and New Ireland," meaning, I suppose, that it occurs in both localities.

40. TRICHOGLOSSUS MASSENÆ, Bp.

Dr. Cabanis (Journ. f. Orn. 1876, p. 324) has lately separated an allied species from New Hanover as *T. flavicans*; but Mr. Brown's single skin appears to me to belong to the true *T. massenæ*. Its exact locality is not stated.

41. TRICHOGLOSSUS SUBPLACENS, Sclater, P. Z. S. 1876, p. 519.

Psitteuteles subplacens, Salvad. Ann. Mus. Civ. Gen. ix. p. 10.

From Duke-of-York Island we have a pair of this recently described species. The female corresponds exactly with the same sex in *T. placens*, but, like the male, has the rump entirely green, like the back.

D'Albertis procured only a single male of this Parrot in S.E. New Guinea, opposite Yule Island.

42. NINOX ODIOSA, sp. nov.

Supra murino-brunnea, plumis capitis et cervicis usque ad dorsum medium albo guttatis : superciliis in fronte conjunctis albis : alis extus maculis rotundis albis in plumarum marginibus externis ornatis ; remigibus intus ad basin albis : subtus albus, pectore dorso concolori, albo guttato et transfasciato, ventre et hypochondriis striis paucis fuscis ornato : rostro flavo, pedibus fuscis : tarsis totis plumosis, digitis setosis : long. tota corp. 7·0, alæ 5·8.

Hab. New Britain (Feb. 1876).

There is but one specimen of this Owl in the collection; and that is, unfortunately, imperfect, the tail being absent, and the wings having been partly cut. There is, however, sufficient evidence that it belongs to a species of *Ninox*, not hitherto recognized, allied to *N. punctulata*[1] of Celebes, but distinguished by the larger and more distinct spots above, and the flammulated belly.

43. PANDION HALIAËTUS.

A skin of this universally distributed species.

[1] *Noctua punctulata*, Quoy et Gaim. Voy. Astr. Zool. i. p. 165.

44. Haliastur girrenera (Vieill.); Sharpe, Cat. i. p. 315.

One adult example. Locality not given.

45. Accipiter etorques.

Urospizias etorques, Salvad. Ann. Mus. Civ. Gen. vii. p. 901.

An adult, and a young specimen, apparently of this new species, lately described by Salvadori from New Guinea and Salawatty, are in the collection, but without exact locality.

The only divergence I note from Salvadori's description of the adult is, that in my specimen the tail-feathers (partly in moult) are of a nearly uniform plumbeous, with but *very faint* indications of any cross markings.

46. Baza reinwardti (Müll. et Schleg.).

A single skin of this species, exact locality not marked, nearly agrees with some specimens in the British Museum.

47. Carpophaga rubricera.

Columba pinon, Less. Zool. Voy. Coq. i. p. 343 (err.) ?

Globicera rubricera, Bp. C. R. xxxix. p. 1073, et Consp. ii. p. 31 (1854), et Ic. d. Pig. t. xxxix.

Carpophaga rubracera, Gray, List of Col. in B. M. p. 18.

Carpophaga lepida, Cass. Pr. Ac. Sc. Phil. vii. p. 230 (1854).

One skin of this fine species, without exact locality. The original type of Bonaparte, however, is from New Ireland; and a second established *patria* is San Christoval, Solomon Islands (*MacGillivray* in Brit. Mus.).

48. Carpophaga van-wycki.

Carpophaga van-wyckii, Cassin, Pr. Ac. Sc. Phil. xiv. p. 320 (1862).

One skin of this rare and little-known species from Duke-of-York Island. The original specimen, described by Cassin, was obtained in New Ireland, during the voyage of the U.S. North Pacific Exploring Expedition, under the command of Captain Rodgers. So far as I know, there are no examples of this Fruit-pigeon in any European collection.

49. Carpophaga spilorrhoa.

Carpophaga luctuosa, Gould, B. Austr. v. pl. 60.

Carpophaga spilorrhoa, Gray, P. Z. S. 1858, p. 186.

One skin of this species.

50. Ptilopus superbus, Gould, B. Austr. v. pl. 57.

One male of this widely spread species.

51. Ptilopus rivolii.

Columba rivolii, Knip et Prev. Pig. ii. pl. 57; Des Murs, Icon. Orn. pl. 4.

Ptilonopus rivolii, Gray, List of Col. in B. M. p. 6.

A pair of this bird, the male of which agrees in every respect with the figures and descriptions above quoted. We have thus a better indication of the true *patria* of this fine Fruit-pigeon than has yet been obtained.

Pt. strophium, Gould, from the Louisiade archipelago, is, I believe, a different species, not having the purple patch in the middle of the belly.

The female of the present bird is of a nearly uniform green, with the lower belly and crissum yellow.

52. Œdirhinus insolitus.

Ptilopus insolitus, Schlegel, Ned. Tijdschr. i. p. 61. pl. iii. fig. 3.

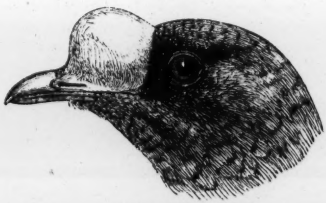
Ptilopus humeralis jobiensis (monstr. ?), Schlegel, Mus. P.-B. *Columbæ*, p. 16.

Œdirhinus globifer, Cab. et Reich. Journ. f. Orn. 1876, p. 326.

One example of this remarkable Pigeon, from Duke-of-York Island, obtained in October 1875. Schlegel originally described his specimen, with which mine appears to agree in all essential particulars, as from "New Caledonia," but subsequently came to the strange conclusion that it was only a monstrous variety of *Ptilopus iobiensis*!

There can be, to my mind, no doubt of the validity of the species, which I agree with Hrn. Cabanis and Reichenow should even constitute the type of a new genus, readily recognizable by the hard bony protuberance on its forehead.

Fig. 2.



Head of *Œdirhinus insolitus*.

Dr. Huesker obtained the specimen described by the last-named author in New Ireland, during the voyage of the 'Gazelle.'

53. Macropygia browni, sp. nov.

Alba: alis caudaque cum dorso toto schistaceo-nigris: pileo postico, hypochondriis, ventre imo et crisso pallide cineracescentibus: rostro basali coccineo, apicali flavo: pedibus rubris: long. tota 18·0, *alæ* 8·8. *caudæ rectr. ext.* 4·0, *med.* 9·0.

Hab. Duke-of-York Island.

Obs. Species forma *M. reinwardti* omnino similis, dorso caudaque schistaceis nec castaneis diversa.

A single skin of this remarkable Pigeon is in the collection. It appears to be in every respect a close ally of *M. reinwardti*, which has a wide range over New Guinea and the Moluccas. My specimen is marked "male, legs red," and is obviously adult. Dr. Salvadori kindly tells me that he has seen several young specimens of *M. reinwardti* with the back and wings blackish; but I cannot believe that the present example is otherwise than mature.

54. MACROPYGIA CARTERETIA, Bp. Consp. ii. p. 57.

Under this name I place two examples, adult and young, from Duke-of-York Island, of a representative of the wide-ranging form which Schlegel (Mus. P.-B. Col. p. 110) calls *M. turtur*, but for which the oldest name, if all the forms are to be referred to one species, is *amboinensis* (Linn.).

Bonaparte's description of his *M. carteretia* from New Ireland is evidently that of a young bird, and, so far as it goes, suits my young specimen pretty fairly.

55. MACROPYGIA NIGRIROSTRIS, Salvad. Ann. Mus. Civ. Gen. vii. p. 972.

An adult bird from New Ireland (Nov. 1875) and a young bird from Duke-of-York Island (Oct. 1875) seem to be referable to this recently described species, which is one of the recent discoveries on Mount Arfak.

The young bird has the head, neck, and breast of a much brighter colour, and freckled with transverse black markings, except on the throat.

The measurements, which are as follows, seem to be slightly inferior to those given by Count Salvadori.

		Long tota. in.	alæ. in.	caudæ. in.
Adult.	New Ireland	11·7	5·7	6·2
Young.	Duke-of-York Island	12·5	5·65	6·2

56. CHALCOPHAPS STEPHANI.

Peristère d'Etienne, Hombr. et Jacq. Voy. au Pôle Sud, t. 28. fig. 2.

Chalcophaps stephani, Puch. Zool. Voy. au P. S. iii. p. 119.

A pair of this species, with the exact locality not given. In the female the forehead is grey instead of white, and there is no purplish colour on the head and nape.

For the range of this species *cf.* Salvad. Ann. Mus. Civ. Gen. ix. p. 206.

57. PHLOGŒNAS MARGARITÆ.

Chalcophaps margarithæ, D'Alb. et Salvad. Ann. Mus. Civ. Gen. vii. p. 836.

Phlogœnas margaritæ, Salvad. op. cit. viii. p. 405.

Chalcophaps margaritæ, Salvad. op. cit. ix. p. 44.

Phlogœnas jobiensis, Meyer, Mitth. zool. Mus. Dresden, i. p. 10 (1875).

Of this beautiful Pigeon there are a pair and a young bird in the collection, without the exact locality.

Now that Salvadori has received the adult of this species from Jobie, I think there can be no doubt that Meyer's *Phlogœnas jobiensis* is merely the young of this bird. I have compared Dr. Meyer's type (now in Mr. Gould's hands on loan) with my young bird, and find them agree in every essential, though Dr. Meyer's specimen shows some traces of the purple colour of the adult appearing on the wing-coverts, which is not the case with my specimen.

It is worthy of notice how nearly allied this species is to *P. erythroptera*, of the Society group, which, however, differs in its rather smaller size and white forehead.

58. PHLOGŒNAS JOHANNÆ, sp. nov. (Plate XVI.)

Fuscescenti-castanea, in dorso æneo lavata: tectricibus alarum minoribus extus nitide purpureis: capite et cervice undique cum pectore pallide cinereis, hoc colore in pileo saturatiore, in pectore clariore et in album purum transeunte: occipite, sicut dorsum, æneo lavato: colore pectoris albo in semicirculum desinente, et margine purpureo sicut in alarum tectricibus præcincto: alarum remigibus primariis fusco-nigris unicoloribus, secundariis et scapularibus extus dorso concoloribus: cauda supra dorso concolori, subtus nigricante, rectricum apicibus fusco-rufis: rostro nigro: oculorum ambitu nudo: pedibus rubris: long. tota 7·8, alæ 4·4, caudæ 2·7, tarsi 1·1.

A pair of this beautiful Ground-dove, which, so far as I can make out, is quite new, are in the collection; the exact locality is unfortunately not given.

The nearest species known seem to be *P. stairi* (G. R. Gray)[1], of the Samoans, from which, however, *P. johannæ* may be readily known by its lovely pure white breast, and *P. canifrons*, Hartl. & Finsch, of the Pelew group[2], in which the hind part of the neck is rusty red.

59. CALŒNAS NICOBARICA (Linn.).

One female, from Duke-of-York Island. Lesson (Voy. Coq. Zool. i. p. 342) has already recorded the occurrence of this species in New Ireland.

60. ARDEA SACRA, Gm.: Finsch et Hartl. Orn. Central-Pol. p. 201.

One skin in the grey, and one in the white plumage, from Duke-of-York Island.

[1] P. Z. S. 1856, p. 7, pl. 115.

[2] Journ. Mus. Godeffr. viii. p. 27, pl. v. fig. 1.

61. Ardea flavicollis, Lath.

Ardetta flavicollis, Gould, B. Austr. vi. pl. 65.

One skin either of the true *A. flavicollis*, or of its Australian representative *A. gouldi*, Bp. (if these are really distinguishable).

62. Megapodius hueskeri, Cab. et Reichenow.

Messrs. Cabanis and Reichenow (J. f. O. 1876, p. 326) describe the Megapode of New Hanover as *M. hueskeri*; and I suppose the single skin sent by Mr. Brown to be of the same species. But Prof. Salvadori tells me that he finds it very difficult to distinguish *M. hueskeri* from *M. forsteni* of the island of Bouru.

63. Rallina tricolor, G. R. Gray, P. Z. S. 1858, p. 188; Gould, B. Austr. Suppl. pl. 78.

One skin of this species, which extends over New Guinea, the Aru Islands, and Cape York.

The collection also contains single skins of the following well-known species:—

64. Charadrius fulvus (Gm.), from Duke-of-York Island.

65. Charadrius mongolicus, Pall.

66. Numenius uropygialis, Gould.

67. Totanus incanus (Gm.), from Duke-of-York Island.

68. Tringoides hypoleucus (Linn.), from Duke-of-York Island.

69. Sterna fuliginosa (Gm.).

70. Anous stolidus (Linn.), from New Ireland.

Having now passed in review the seventy species in Mr. Brown's collection, let us, before making any general remarks on it, consider what was already known of the *ornis* of these islands. Duke-of-York Island and New Britain may be dismissed in a few words, no previous naturalist having, so far as I am aware, made any investigation of the faunas, although a few chance specimens may have been procured from them[1]. But New Ireland has been more favoured. In 1823 it was visited by the French naturalist, Lesson, during the celebrated voyage of the 'Coquille,' which added so much to our knowledge of the fauna of the Eastern Islands. The 'Coquille' remained from the 12th to the 21st of August of that year at Port Praslin, near the extreme south of New Ireland[2]. In July 1827

[1] New Britain is the undoubted *patria* of *Casuarius bennettii*, of which the first (living) example was received by the Society in 1857.

[2] Cf. Zool. Voy. Coquille, i. p. 329 *et seq.*

another French discovery-vessel, the 'Astrolabe,' passed several days in the adjoining port Havre Carteret; and Messrs. Quoy and Gaimard, the naturalists on board, though embarrassed by bad weather, made several additions to Lesson's ornithological discoveries. In the summer of 1841, Havre Carteret was again visited by the English vessel H.M.S. 'Sulphur' (under the command of Sir E. Belcher). Surgeon Hinds certainly made a collection of birds on the occasion, although Mr. Sharpe informs me that only three specimens are registered in the British Museum as having been obtained in New Ireland from the voyage of the 'Sulphur.'

From these sources we were acquainted, previously to the arrival of the present collection, with the existence of some 25 birds in New Ireland[1]. Mr. Brown has added at least six or seven species to the list; and it is only from the defective labelling of his specimens, as I believe, that we have not obtained from him a much more complete insight into the character of its *ornis*.

Enough, however, is now known to show that New Ireland must be referred decidedly to the Papuan Subregion[2] of the Australian avifauna. The presence of such forms as *Gracula*, *Eclectus*, *Nasiterna*, *Lorius*, and *Calœnas* is quite sufficient to prove that it belongs strictly to the northern section of the Australian Region, rather than to Australia itself; and there can be little doubt that New Britain, New Hanover, and the whole of the Solomon groups belong strictly to the same subregion. Let us hope that Mr. Brown may be induced to continue his collections, and to give us further opportunities of continuing these interesting investigations.

2. On a Collection of Chiroptera from Duke-of-York Island and the adjacent parts of New Ireland and New Britain. By G. E. Dobson, M.A., M.B., F.L.S., &c.

[Received February 2, 1877.]

(Plate XVII.)

Mr. P. L. Sclater, Secretary of the Society, has most kindly placed in my hands for examination an exceedingly interesting collection of Chiroptera from Duke-of-York Island and andajcet coasts of New Ireland and New Britain, forwarded to him by the Rev. George Brown, C.M.Z.S.

Although the collection consists of seventeen specimens only, twelve distinct species are represented, of which four are undescribed, one is the type of a new genus and species, and ten are new to the fauna of these little-known islands.

[1] I had intended to have given a complete list of the known birds of New Ireland as an appendix to the present paper, but, not having had time to complete it satisfactorily, must reserve it for a future communication.

[2] For general remarks on the division of the Australian Region into subregions, see P. Z. S. 1869, p. 125.



J. Smit. lith. M&N. Hanhart. imp.

MELONYCTERIS MELANOPS.



Suborder MEGACHIROPTERA.

Family PTEROPIDÆ.

Group I. PTEROPI.

PTEROPUS MELANOPOGON.

Pteropus phaiops, Temm. Monogr. Mammal. ii. p. 65 (1835–41).

Pteropus melanopogon, Schlegel; Peters, Monatsber. Akad. Berl. 1867, p. 330.

Pteropus melanopogon, var. *neohibernicus*, Peters, *l. c.* 1876, p. 317.

Although the single specimen in the collection is larger and has considerably shorter ears than those described under the above name by Dr. Peters, I have no hesitation in referring it to the same species, as it agrees in all other respects with them and comes from the same locality. In size and in the shortness of the ears it agrees more closely with *Pt. degener*, Peters, from the Aru Islands, but differs from that species in the much wider space occupied by the hair of the back, which is more than an inch in breadth across the loins. But in *Pt. melanopogon* the width of the space occupied by the fur of the back diminishes as the animal increases in age; and the length of the ears is not only slightly variable in different individuals of every species of the genus, but is often very considerably lessened by a peculiar ulcerative process which attacks the margins of the ears. I believe therefore that *Pt. degener*, Peters, has been founded on a fully grown or even aged individual of *Pt. melanopogon*, that *Pt. melanopogon*, var. *neohibernicus*, has been described from young individuals, and that the specimen in this collection is intermediate in age between the two. In the following table the relative measurements of these specimens are given for the purpose of comparison:

	Length of head.	ear.	forearm.	second finger.	fourth finger.	tibia.	calcaneum.	foot and claws.	Sex.
	in.	in.	in.	in.	in.	in.	in.	in.	
Pt. degener, Peters. Aru Islands	3·8	0·88	7·7	...	...	3·4	1·08	2·4	♂
Pt. melanopogon, Dobson. New Ireland	3·7	0·9	7·0	14·0	9·4	3·3	1·1	2·4	♂
Pt. melanopogon, var. *neohibernicus*, Peters. New Ireland.	...	1·1	5·0	...	...	...	...	...	♀

The fur in our specimen is dark reddish brown on the face, between the eyes, and under the jaws; head, neck, shoulders, and the

whole under surface of the body bright reddish brown, the hairs paler and more yellowish towards the base; on the back dark brown, intermixed with bright sulphur-yellow, which replaces the brown across the loins; interfemoral membrane with longer, dark brown, almost black hairs.

PTEROPUS CAPISTRATUS.

Pteropus capistratus, Peters, Monatsber. Akad. Berl. 1876, p. 316, pl.

A single specimen of an adult female of this remarkable species agreeing in all respects with the original description. The single central longitudinal black line dividing the forehead, with a similar dark-coloured streak across the face on each side between the eye and the angle of the mouth, as well as its considerably larger size, at once distinguish this species from *Pt. personatus*, to which it is in all other respects very closely allied.

CYNONYCTERIS BRACHYOTIS, sp. nov.

Resembles *C. minor*, Dobson, in size and in the nakedness of the extremities, but may be at once distinguished by the much shorter ears, longer muzzle, and deciduous first upper premolars.

Ears short, oval, rounded off above; a prominent thickened lobule at the base of the outer margin of the ear-conch; muzzle long and narrow, nostrils and upper lip as in *C. amplexicaudata*.

Fur short, dark brown above, with greyish tips; beneath light greyish brown. On the upper surface the back of the neck and shoulders (in an adult female) is very thinly covered, almost naked, and the fur of the body scarcely extends upon the membranes; the tibiæ and feet and adjacent interfemoral membrane are naked; beneath, a broad band of fur extends outwards behind the elbow and forearm, lessening in width towards the carpus.

First upper premolar very small in immature individuals, deciduous in adults; remaining teeth as in *C. amplexicaudata*.

In the following Table the relative measurements of this species and of *C. minor*, Dobson, are given.

	Length of head.	" eye from nose.	" ear.	" forearm.	" thumb.	" second finger.	" fourth finger.	" tibia.	" foot and claws.
C. brachyotis.....	1·5	0·55	0·55	2·85	0·9	4·5	3·4	1·15	0·7
C. minor	1·55	0·45	0·68	2·8	0·9	4·4	3·3	1·05	0·75

The collection contains two specimens—a perfectly adult female, from which the above specimens were taken, and an immature female.

Fig. 1.



Fig. 2[1].



Fig. 3.



Fig. 2*a*.



Fig. 3*a*.



Fig. 1. Head of *Harpyia major*.
Figs. 2 and 2*a*. Skull and lower jaw of *Harpyia major*.
Figs. 3 and 3*a*. Skull and lower jaw of *H. cephalotes*.

HARPYIA MAJOR, sp. nov.

Much larger than *H. cephalotes*, Pallas, but with shorter ears, longer nasal tubes, and much paler-coloured fur, differing also in the form of the skull and of some of the teeth.

Fur above pale buff, the base of the hairs on the back dark; ex-

[1] The back of the skull is imperfect in the specimen from which this figure was drawn.

tremities of the hairs on the head and about the ears yellow; on the back the greater part pale buff; a dark vertebral line, as in *H. cephalotes*, extends from a point between the shoulders to the tail; beneath dull yellowish buff throughout.

Upper canine on each side with a prominent external cusp; last lower molar with a circular crown. In *H. cephalotes* the upper canine has a blunt ill-defined external projection, and the crown of the last lower molar is oval or quadrilateral. The skull in this species is also very much larger and differently shaped. The frontal bone is deeply grooved between the postorbital processes; and the nasal bones terminate at such a height above the præmaxilla as to be on the same level with the floor of the groove behind them; the zygomatic arch is more than twice as thick as in *H. cephalotes*; and the postorbital processes of the frontal are longer.

The following Table exhibits the measurements of the type of this species, of another, immature specimen with the epiphyses of the finger-bones unconsolidated, and of a perfectly adult specimen of *H. cephalotes* from Timor.

	Length of head.	ear.	forearm.	thumb.	first finger.	second finger (metacarp.).	second finger (1st phal.).	second finger (2nd phal.).	fourth finger (metacarp.).	fourth finger (1st phal.).	fourth finger (2nd phal.).	tibia.	foot and claws.
	"	"	"	"	"	"	"	"	"	"	"	"	"
H. major	1·55	0·55	3·1	1·3	2·2	2·15	1·65	2·3	2·0	1·0	1·2	1·2	0·7
" (immature).	1·5	0·55	2·95	1·3	2·0	1·9	1·55	2·1	1·85	0·95	1·05	1·1	0·7
H. cephalotes.....	1·3	0·6	2·4[1]	0·9	1·6	1·6	1·25	1·7	1·6	0·75	0·85	0·85	0·5

CEPHALOTES PERONII.

Cephalotes peronii, Geoffroy, Ann. du Mus. xv. p. 104 (1810); Temminck, Monogr. Mammal. ii. p. 106.

Hypoderma peronii, Is. Geoffroy, Dict. Classiq. xiv. p. 708.

The collection contains two specimens of this species—an immature female, and a young male with milk-dentition. In the latter there are four upper incisors and two lower.

Group II. MACROGLOSSI.

MACROGLOSSUS MINIMUS.

Pteropus minimus, Geoffroy, Ann. du Mus. xv. p. 97 (1810).

Pteropus rostratus, Horsfield, Zoolog. Researches in Java (1825).

[1] I have found this to be the constant length of the forearm of all perfectly adult specimens of *H. cephalotes* from the Malay archipelago.

Macroglossus minimus, Temminck, Monogr. Mammal. i. p. 191 (1827); Dobson, Monogr. Asiat. Chiropt. p. 34 (1876).

Two specimens of this widely distributed species, differing in no respect except in their slightly smaller size from individuals inhabiting the peninsula of India and Java, and probably identical with the small variety from Australia to which Dr. Peters has given the name *M. australis*.

MELONYCTERIS[1], gen. nov.

Muzzle long, narrow, cylindrical; nostrils projecting slightly; upper lip with a vertical groove, bounded laterally by naked raised edges as in *Pteropus* and *Cynopterus*; index finger with a distinct claw; metacarpal bone of middle finger as long as the index finger; wing-membrane from the sides of the body and from the dorsal surface of the base of the middle toe; tail none, or very short.

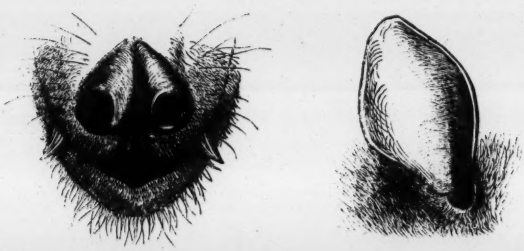
Dentition.—Inc. $\frac{4}{2-2}$; C. $\frac{1-1}{1-1}$; Pm. $\frac{3-3}{3-3}$; M. $\frac{2-2}{3-3}$.

First upper and lower premolars very small, close to the base of the canines; molars close together, very narrow, scarcely elevated above the gum.

Tongue very long and narrow, as in *Macroglossus*.

This genus is most closely related to *Macroglossus*, with which it agrees in the general form of the skull and in the mode of attachment of the wing-membrane to the sides of the body, but is distinguished by the very different position and size of the first premolars, by the origin of the wing-membrane from the middle toe instead of from the base of the fourth, and by the form of the extremity of the muzzle.

Fig. 4. Fig. 5.



Front of muzzle and ear of *M. melanops*.

MELONYCTERIS MELANOPS, sp. nov. (Plate XVII.)

Slightly smaller than *Eonycteris spelæa*, Dobson, which it resembles closely in the external form of the muzzle; nostrils as in *Cynonycteris amplexicaudata*, but scarcely so prominent, separated by a deep groove which passes down to the upper lip, where it becomes

[1] μῆλον, tree-fruit; νυκτερίς, a bat.

narrower and is margined as in *Cynopterus* by raised naked edges (fig. 4); tongue very long, much attenuated in terminal fourth, armed with recurved, brush-like papillæ; ears about as long as the muzzle, oval, rounded off above, the outer and inner margins of the ear-conch equally convex, so that the ear attains its greatest width in the middle (fig. 5).

Interfemoral membrane very short behind; no trace of a tail in either of the specimens. Wing-membrane from the base of the middle toe, or from the space between the second and middle toe, and from the sides of the body. Fur moderately short, but very dense, extending thickly upon the wing-membrane as far outwards as a line drawn from the elbow to the knee, and more thinly for a considerable distance beyond, and also covering the short interfemoral membrane and the legs. Above bright reddish yellow, the base of the hairs dark; crown of the head dark brown, the extremities of the hairs greyish yellow; a large patch round each eye dark brown, almost black; anterior half of the muzzle pale buff, a narrow streak of the same colour passing backwards between the eyes; the whole under surface of the body dark brown, almost black, the extremities of the hairs greyish; the fur on the sides of the body longer. and the terminal half of the hairs brownish buff.

Upper incisors small, forming a semicircle in front, and separated from the canines by a wide space on either side; central incisors somewhat larger than the outer ones, and converging slightly; lower incisors very small, in pairs, separated by a space between; upper

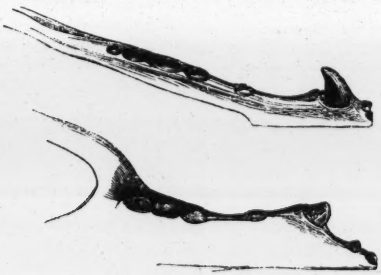


Fig. 7.

Upper and lower jaws of *M. melanops*.

canines remarkably long and strong, deeply grooved anteriorly by a longitudinal furrow: first upper premolar exceedingly small, and so close to the canine as to appear to be a small basal projection from that tooth; second premolar larger than any of the other teeth (except the canines), in the centre of the wide space between the canine and first molar; third premolar shaped like the second premolar, but much smaller and close to the first molar; molars very narrow, scarcely raised above the gum; first lower premolar larger than the

corresponding tooth in the upper jaw, but still very small, and similarly placed close to the canine, and separated from the second premolar by a wide space equal to the distance between the lower canines; second lower premolar scarcely larger than the third, and separated from it by a wide space; third premolar close to the first premolar; molars close together, very narrow, their roots and those of the other teeth in both jaws visible through the exceedingly thin translucent alveoli (figs. 6 and 7).

The molar teeth in this species appear to be proportionally smaller than in any other known species of Megachiroptera, while the canines are longer and stronger.

Length (of an adult ♂): head and body 4″·0; head 1″·4; eye from nose 0″·55; ear 0″·6; forearm 2″·4; thumb 0″·85; first finger 1″·9; second finger—metacarp. 1″·85, 1st ph. 1″·35, 2nd ph. 1″·9; fourth finger—metacarp. 1″·9, 1st. ph. 0″·8, 2nd ph. 0″·8; tibia 1″·05; calcaneum 0″·3; foot and claws 0″·7.

Suborder MICROCHIROPTERA.

Family Rhinolophidæ.

Phyllorhina tricuspidata.

Rhinolophus tricuspidatus, Temminck, Monogr. Mammal. ii. p. 20, pl. 32. figs. 11, 12 (1835–41).

One specimen of this small species with fur bright reddish brown above and beneath. *P. tricuspidata* is probably the smallest species of Rhinolophidæ, and has hitherto been recorded from the Moluccas and Amboyna only.

Phyllorhina galerita.

Hipposideros galeritus, Cantor, Journ. Asiat. Soc. Beng. 1846, p. 183.

Phyllorhina labuanensis, Tomes, P. Z. S. 1858, p. 538.

Phyllorhina longicauda, Peters, Monatsber. Akad. Berl. 1861, p. 708.

Phyllorhina brachyota, Dobson, Journ. Asiat. Soc. Beng. 1874, p. 237.

Phyllorhina galerita, Dobson, Monogr. Asiat. Chiropt. p. 69 (1876).

The single specimen in the collection agrees with individuals of this species from the Oriental Region in having the tail almost wholly included in the interfemoral membrane, and not with the very closely allied *P. cervina* from Australia, which has the last and half the antepenultimate caudal vertebra free. It is therefore very doubtful if *P. cervina* can be considered distinct from this species.

As *P. galerita* is also found in the Peninsula of India and in Burmah, its geographical distribution is very wide, much wider than that of any other known species of Rhinolophidæ; for although *P. speoris* was described by Zelebor under the name of *P. taitiensis*, we are not absolutely certain that the specimen so named was really obtained at the island Tahiti.

PHYLLORHINA CALCARATA, sp. nov. (Fig. 8.)

Ears as long as the head, triangular, with obtuse extremities; inner margin of the ear-conch very convex in lower half, almost straight above; outer margin slightly concave immediately beneath the tip, then straight. Nose-leaf simple in front, no secondary leaflets on the sides of the muzzle; horizontal leaf narrow, like that of *P. bicolor*; the transverse terminal leaf as in *P. larvata*, broader than the sella, with three short ill-defined vertical ridges dividing its concave front surface; a small frontal pore behind the transverse nose-leaf.

Fig. 8.



Head of *Phyllorhina calcarata*.

First phalanx of the thumb as long as the metacarpal bone. Wings from the tarsus. Calcaneum remarkably long and strong, longer than in any other known species of the genus, exceeding half the tibia in length; tail long, projecting one tenth of an inch beyond the interfemoral membrane.

Fur long and dense, above dark brown, the base of the hairs much paler, especially on the anterior half of the body; beneath, orange-brown.

Length: head and body 2″·5; tail 1″·4; head 0″·85; ear 0″·85; nose-leaf 0″·3 × 0″·22; forearm 2″·0; thumb 0″·35; second finger—metacarp. 1″·3, 1st ph. 0″·8, 2nd ph. 1″·0; fourth finger—metacarp. 1″·45, 1st ph. 0″·65, 2nd ph. 0″·55; tibia 0″·9; calcaneum 0″·6; foot and claws 0″·4.

Family VESPERTILIONIDÆ.

KERIVOULA HARDWICKII.

Vespertilio hardwickii, Horsfield, Zoolog. Researches in Java (1825).

Kerivoula hardwickii, Gray, Ann. & Mag. Nat. Hist. 1842, p. 258; Dobson, Monogr. Asiat. Chiropt. p. 148, figs. *a*, *b*, *c* (1876).

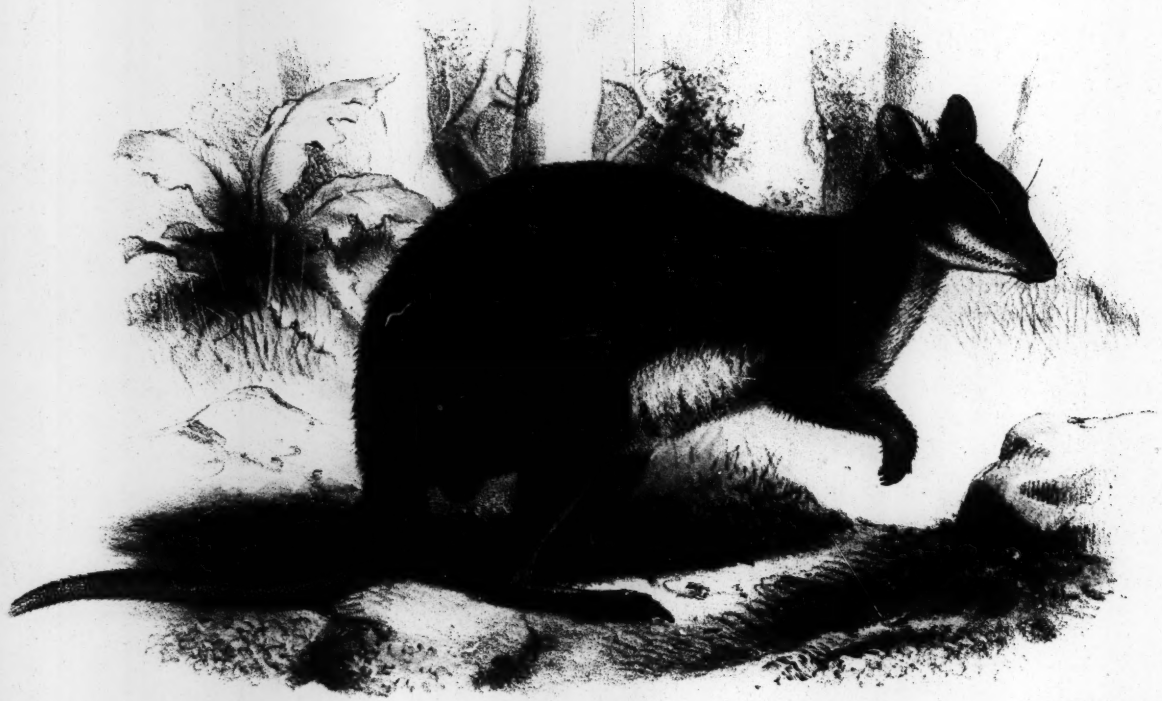
Although the single specimen representing this genus is larger and has comparatively larger outer incisors and brighter-coloured fur than individuals of *K. hardwickii* from India and Java, I have nevertheless no hesitation in referring it to that species, with which it agrees very closely in all other respects.



J. Smit. lith.

M&N Hanhart imp.

UROMYS RUFESCENS



J. Smit del. & lith.

M&N Hanhart imp.

MACROPUS LUGENS.

Family EMBALLONURIDÆ.

EMBALLONURA NIGRESCENS.

Mosia nigrescens, Gray, Voyage of the 'Sulphur,' Mammals, p. 23 (1844).

A single specimen of this, the smallest species of the genus, which is at once distinguished from *E. monticola* from the adjoining parts of the Oriental region by the very differently shaped muzzle, by the widely separated nostrils, and by its conspicuously smaller size.

E. nigrescens has hitherto been recorded from Amboina and Ternate only.

Besides the discovery of the new species described above, the following generalizations are afforded by an examination of the species represented in this collection:—

I. That New Britain and New Ireland agree very closely in their Chiropterous fauna with that of other lands within the Australian region (Austro-Malayan subregion), three species only out of twelve (*Macroglossus minimus*, *Phyllorhina galerita*, and *Kerivoula hardwickii*) extending also into the Oriental region.

II. That, to judge from the large proportion of frugivorous Bats in the collection (nearly two thirds of the whole), New Britain and New Ireland agree with the Oceanic Islands in this respect, rather than with the continental lands within the Australian region.

3. On the Rodents and Marsupials collected by the Rev. G. Brown in Duke-of-York Island, New Britain, and New Ireland. By EDWARD R. ALSTON, F.L.S., F.Z.S., &c.

[Received February 14, 1877.]

(Plates XVIII. & XIX.)

Mr. Sclater has kindly intrusted me with the determination of the Rodents and Marsupials contained in Mr. Brown's interesting collection.

They are few in number, consisting of but six species. Three of these appear to be identical with animals known to inhabit New Guinea, while the remainder belong to hitherto undescribed species. The latter, however, find their nearest allies either in New Guinea or in Northern Australia, thus fully confirming the strictly Papuan character of the fauna of this group. The large proportion of new species in this small collection shows, nevertheless, that a perceptible amount of change has taken place, and leads us to hope that many novelties will yet reward the researches of Mr. Brown, after whom I propose to name the first of the new species:—

1. MUS BROWNI, sp. n.

Fur both above and below stiff and harsh, most of the hairs being developed into fine flattened and channelled spines; on the back a

few much longer cylindrical bristly hairs. Ears moderate, rounded, almost naked. Tail nearly naked, covered with about 150 rings of large scales mixed with very short stiff hairs. Hind feet large and broad, thumb of fore feet well developed, with a flat nail.

Upper parts grey mixed with reddish, each bristle being light grey at the base and either black or light rufous towards the tip, the longer hairs black throughout. Chin, throat, breast, belly, and inside of limbs dull white; feet white, each with a dark stripe on the upper surface; on the fore feet this mark is near the middle of the foot, on the hind feet nearer the outer edge. Ears and tail dusky.

Measurements of two specimens (in spirits):—

	♂ in.	♀ in.
Length of head and body	5·60	5·15
„ head	1·55	1·45
„ ear	·55	·55
„ tail	4·90	4·50
„ hind foot	1·00	·95

Skull and teeth typically murine. Female with two pair of pectoral and two of abdominal teats; male with testes very largely developed.

This spiny Rat is nearly allied to the North Australian species described by the late Dr. Gray under the name of *Acanthomys leucopus*[1]; but it is a very much smaller species, and differs both in colour and proportions. The collection contains a female in skin and both male and female in spirits.

Along with these are four young Mice too immature to be safely determined. If, as I believe, they belong to the present species, the hair is softer and the colour of the upper parts more rufous in youth.

2. Uromys rufescens, sp. n. (Plate XVIII.)

Fur close and woolly, the longer hairs little developed. Ears short, rounded, naked. Tail shorter than the head and body, naked, tessellated with very small convex subcircular scales.

Upper parts bright chestnut, the hairs being lead-coloured at the base and broadly tipped with bright rufous, the longer hairs black, the top of the head more greyish. Lower parts white, the two colours being sharply defined; feet pale brownish. Ears and tail dusky.

Measurements of a female (in spirits):—

	in.
Length of head and body	5·00
„ head	1·45
„ ear	·50
„ tail	4·30
„ hind foot	1·05

[1] P. Z. S. 1867, p. 598. This, like the present species, clearly belongs to true *Mus* and not to *Acanthomys*, Lesson (= *Acomys*, Geoffr.). It will therefore require to be renamed, Gray's specific title being preoccupied by the common North-American Mouse, *Mus leucopus*, Raffinesque (*Hesperomys leucopus* auctt.).

This handsome Rat is most nearly allied to the species from Salawatti, recently described by Dr. Peters and the Marquis G. Doria as *U. bruijni*[1]; but it is about a third smaller, is more uniformly rufous in colour, and has the tail markedly *shorter* (instead of longer) than the head and body. All the other described species have long particoloured tails[2].

Dr. Peters, in his original characters of this genus[3], says that the dentition is quite similar to that of *Mus*; but one of the present specimens, having the teeth less worn than in his example of *U. macropus*, shows that the ridges of the molars are not definitely divided into tubercles. The viscera are almost exactly like those of the common Rat, except that the cæcum is slightly more elongated.

3. Perameles doreyanus.

Perameles doreyanus, Quoy et Gaim. Voy. de l'Astrolabe, i. p. 100, Atlas, pl. xvi.

The collection contains one skin of this well-known Papuan species. First discovered (but not systematically named) by Lesson and Garnot on the island of Waigiou[4], it was afterwards found by Quoy and Gaimard at Dorey Harbour, New Guinea. According to Dr. Gray, specimens were sent by Mr. Wallace from the Aru Islands[5]; but the *Perameles* of that group has since been separated by Dr. Peters and the Marquis G. Doria as *P. aruensis*[6]; and the same authors have described two other allied species—*P. rufescens* from the Ké Islands[7], and *P. longicaudata* from New Guinea[8].

4. Belideus ariel.

Belideus ariel, Gould, P. Z. S. 1842, p. 11.

This pretty little Flying Phalanger is represented by an adult male and female in skin, and an immature male in spirit. In the female the extreme tip of the tail is white, doubtless an individual variety. As in other Papuan examples, there is a much broader dark mark round the eye than in the North-Australian specimens described by Mr. Gould[9]; but I do not think they can be specifically separated; and when a sufficient series from different parts of the continent of Australia are compared I suspect that this species will have to be united with the southern *B. breviceps*.

The known range of this Phalanger is extensive. First described from North Australia, it has been found in New Guinea by S. Müller, in Batchian and the Aru Islands by Wallace and Von Rosenberg, and in Halmahera by Bernstein.

[1] Ann. Mus. Civ. Genova, viii. p. 336 (1876).

[2] Dr. A. B. Meyer lately indicated a new species from New Guinea under the name of *U. papuanus* (Ann. and Mag. Nat. Hist. 1876, xvii. p. 146), without giving any description. As he states, however, that it is nearly allied to *U aruensis*, Gray, it can hardly be the present animal.

[3] Monatsb. Ak. Berlin, 1867, p. 343.

[4] Voy. de la Coquille, i. pt. 1, p. 123.

[5] P. Z. S. 1858, p. 113.

[6] Ann. Mus. Civ. Genova, vii. p. 542.

[7] *Op. cit.* p. 541.

[8] *Op. cit.* viii. p. 335.

[9] In the figure in the 'Mammals of Australia' (i. pl. xxvii.) no black mark whatever is shown; but a narrow black line is mentioned in the description.

5. CUSCUS ORIENTALIS.

Didelphys orientalis, Pallas, Misc. Zool. p. 59.

An adult female *Cuscus* in skin and a half-grown female in spirits are strikingly different in appearance; but I cannot at present separate them from this very variable species. The former is of a dark sooty grey above, with an obscure dorsal streak; the fur is very close and woolly; and the tips of the hairs have a bright silvery lustre. The latter (which measures, head and body, 8·80 inches, tail 7·80 inches) is bright shining rufous above, slightly washed with black, but with no definite dorsal streak; lower parts and spot below ear light yellow.

Both differ from the characters usual given of *C. orientalis* in having only *two* small incisors behind the large central lower pair, and in wanting the small extra premolar in the upper jaw. But, as Mr. Waterhouse has observed[1], these small teeth are not to be trusted in this group. I find that a skull of *C. ursinus* in the British Museum has two small incisors on one side and three on the other; and of two skulls of *C. celebensis*, Gray, a male has one only in each ramus, while a female has one on the right and three on the left. In all other essential characters Mr. Brown's specimens agree with *C. orientalis*; and it must be left to future observation to show whether the peculiarity of their dentition is or is not constant.

According to Lesson and Garnot this animal is termed *Kapoune* by the natives of New Ireland, with whom it is a favourite article of food[2].

6. MACROPUS LUGENS, sp. n. (Plate XIX.)

Muffle entirely naked, the bare space extending in a band over each nostril. Ears moderate, sparsely haired except near the base. Tail clad for the first three inches with short woolly hair, thence to the end scaly, nearly naked at the sides, more thickly clad above and below with short stiffish hairs. Fur moderately soft, not close-set, with no under-fur; hair of occiput radiating from a point a little behind the ears, that of the nape directed *backwards*, that of the vertex *forwards*, forming a transverse crest where it meets the fur of the forehead and temples. Hair of breast radiating from each axilla, that of the throat and chin directed *forwards*.

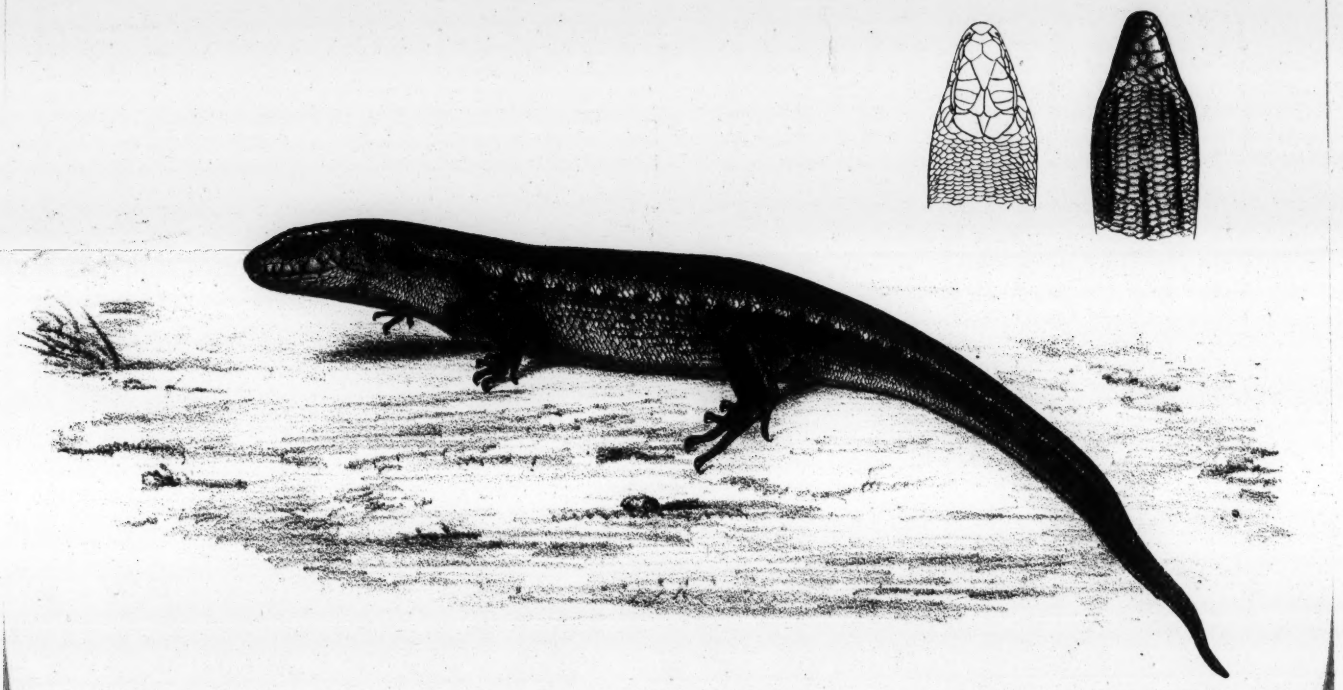
Upper parts almost uniform umber-brown, darkest on the back, the hairs unicolorous to the base, flanks and thighs lighter, feet darker brown. From the upper lip a broad but ill-defined brownish-white stripe passes to below the eye. Chin brownish black; throat, breast, and belly pale isabelline.

Approximate measurements (in skin) of an immature male:—

	in.
Length of head and body	22·00
„ head	3·50
„ ear	1·75
„ tail	14·00
„ hind foot (without claw)	4·50

[1] Nat. Hist. Mamm. i. p. 265. [2] Voy. de la Coquille, Zool. i. p. 158.

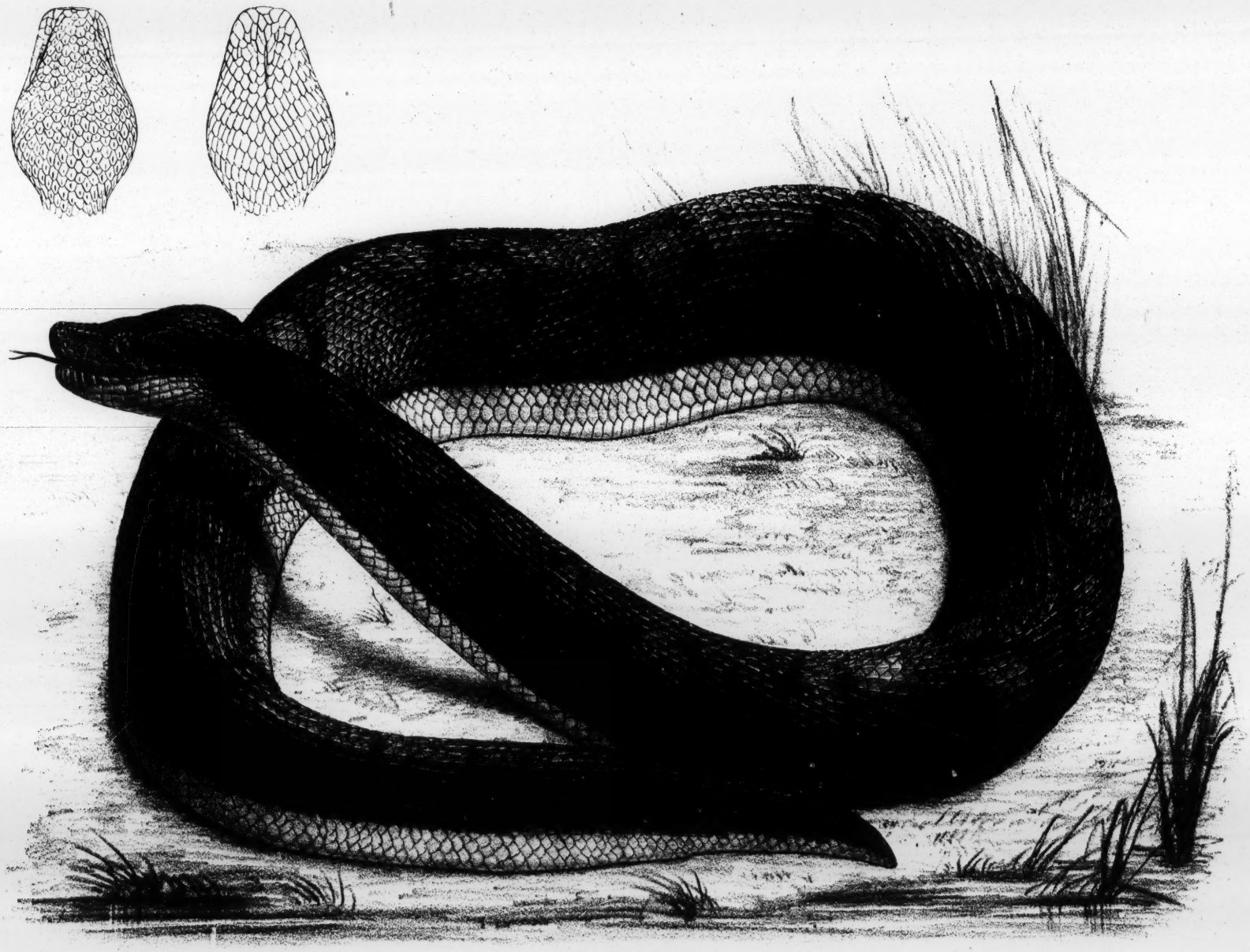




R.Mintern lith.

Mintern Bros. imp.

HINULIA MEGASPILA.



R.Mintern lith.

EREBOPHIS ASPER.

Mintern Bros. imp.

The third upper incisor is but little longer than the second, and has the external fold close to its posterior border. The milk-molars are still retained; but the premolar, when exposed in the maxillary, is found to be only slightly longer than the first true molar, the former measuring ·27, and the latter ·22 of an inch.

This interesting Kangaroo bears a striking superficial likeness to *Dorcopsis luctuosa* (D'Alb.)—a resemblance which, along with its generally sad-coloured coat, suggests the specific name proposed. Even externally, however, it may be at once distinguished by the direction of the hair of the nape, the nearly naked scaly tail, and the uniform brown of the upper parts, while its dentition at once shows it to be not a *Dorcopsis* but a true *Macropus*.

When Mr. Garrod first clearly established the distinctions between *Dendrolagus*, *Dorcopsis* and *Macropus*[1], only one species of the last genus was known to inhabit the Austro-Malayan Subregion, namely *M. bruni* (Schreb.), from the Aru and Ké Islands. Since then two species have been described from New Guinea—*M. papuanus* by Dr. Peters, from the eastern extremity of the island[2], and *Halmaturus crassipes* by Mr. E. Pierson Ramsay, from Port Moresby[3]. From all of these, as well as from all the Australian species, *M. lugens* appears to be perfectly distinct. In the character of the covering of the tail it most resembles *M. papuanus*, from which, however, it differs in its entirely bare muffle, and in the proportions of its upper incisors, as well as in coloration.

I trust that Mr. Brown may soon be able to procure fully adult examples of this Kangaroo, and also to give us information as to the exact habitat of this and the other species contained in his collection.

4. On a Collection of Reptiles and Fishes from Duke-of-York Island, New Ireland, and New Britain. By Dr. Albert Günther, V.P.Z.S.

[Received Feb. 20, 1877.]

(Plates XX. & XXI.)

A collection of Reptiles made by the Rev. G. Brown on Duke-of-York Island forms a valuable contribution to the very scanty knowledge we possess at present of the Reptiles of New Ireland and New Britain. Indeed, since the visit of the French naturalists Lesson and Garnot, those islands have been entirely neglected, only a few species having reached European collections from the neighbouring Solomon Islands. The species forming this first collection of Mr. Brown, are not sufficient in number to base upon them a more precise conclusion than that arrived at by Mr. Wallace, who appears to

[1] "On the Kangaroo called *Halmaturus luctuosus* by D'Albertis and its Affinities," P. Z. S. 1875, pp. 48–59, pls. vii.–ix.

[2] Ann. Mus. Civ. Genova, vii. p. 544 (1875).

[3] Proc. Linn. Soc. New S. Wales, i. p. 162 (1876).

be quite correct in including these islands in his Austro-Malayan subregion, as will be seen from the following list, in which I have noted the geographical range of each species.

List of Reptiles.

Lizards:

1. *Monitor chlorostigma*, Cuv. ..... Celebes, Ceram, New Guinea, North Australia, Solomon Islands.
2. *Eumeces albofasciolatus*, Gthr..... North Australia.
3. *Hinulia megaspila*, sp. n.
4. *Keneuxia smaragdina*, Less. ..... Ceram, Amboyna, Philippines, Pelew Island, New Guinea.
5. *Mabouia carteretii*, D. & B..... ... New Ireland, New Guinea, Amboyna, and Wokan (*Doria*).
6. *Mabouia cyanura*, Less. ..... Amboyna, Mysol, New Guinea, hence throughout Polynesia.
7. *Mabouia nigra*, Hombr. & Jacq. ..... Fiji Islands, Samoa Islands, Contrariété Island.
8. *Gecko vittatus*, Latr. ..... Mysol, Ceram, Amboyna, New Guinea, Aru Islands.
9. *Hypselurus macrolepis*, Ptrs. ..... Pelew and Solomon Islands.

Snakes:

1. *Lielaphis modestus*, Schleg. ..... Ceram, Amboyna, Mysol, Aru Islands.
2. *Tropidonotus hypomelas*, sp. n.
3. *Dendrophis solomonis*, Gthr. ..... Solomon Island.
4. *Dendrophis macrops*, sp. n.
5. *Dipsas irregularis*, Merr. ..... Celebes, Ceram, Amboyna, Mysol, Sangi Isl., New Guinea, Key Isl.
6. *Liasis amethystinus*, Schneid. ..... Ceram, Mysol, Aru and Key Islands, New Ireland.
7. *Nardoa schlegelii*, Gray. ..... New Ireland.
8. *Exygrus carinatus*, Schneid. ..... Ceram, Amboyna, Mysol, New Guinea.
9. *Erebophis asper*, g. et sp. n.
10. *Diemenia mülleri*, Schleg. ..... New Guinea, North Ceram.
11. *Platurus fasciatus*, Daud. ..... Throughout the East Indian archipelago and Polynesia.

Descriptive Notes.

Hinulia megaspila, sp. n. (Plate XX.)

Resembles *H.* (*Eumeces*) *aruensis* in shape and general appearance. No supranasal shields. Lower eyelids scaly. Internasal broad and short, transversely linear, separated from the vertical by two frontals, which are broadly in contact with each other. In *E. aruensis* the vertical is in contact with the internasal. Postnasals two, small and lateral, followed by a single large loreal; upper labials eight. Ear-opening large, oval, without prominent scales; forty-one or forty-seven longitudinal series of scales round the body; about fifty-eight transverse series between the fore and hind limbs; two larger præanal plates, with some smaller lateral ones. The fore limbs reach to the middle of the eye when stretched forward, the hind limbs somewhat beyond the middle of the trunk. Fingers and toes short; third and fourth fingers equal and longer than the second; fourth hind toe the longest; third longer than the fifth. Colour brown;

three large round black spots on the side of the neck; the first above the ear-opening, the second immediately behind it, the third above the axil; a series of numerous smaller black irregular spots along the upper part of the sides. Sides finely mottled with black striæ. Lower parts whitish; throat of one specimen with three blackish longitudinal bands, the middle being much less distinct than the lateral.

	in.	lin.
Total length	8	0
Distance of the snout from the eye		3½
" " ear		9
" " axil	1	5
" " vent	3	11
Length of fore limb	1	0
" third finger		2½
" hind limb	1	6
" second toe		2
" third toe		3
" fourth toe		5½
" fifth toe		3

LIELAPHIS MODESTUS.

A Snake widely spread in the Austro-Malayan region, varying in some points which may generally be relied upon as constant characters, and showing affinities to several very distinct types, hence often misunderstood, and appearing in the literature under many denominations. It is distinguished by a depressed head, with rather broad snout, small eye, and subvertical pupil, appearing round when expanded. Normally two shields in front and behind the eye; but these shields are frequently confluent into one, sometimes on one side of the specimen only; sometimes the lower præocular coalesces with the loreal. Seven (very rarely eight) upper labials, the third and fourth entering the orbit. Arrangement of the temporals irregular and variable. Body elongate, slightly compressed, the ventral scutes showing more or less lateral keels, which disappear entirely in large females. Scales smooth, in seventeen rows. Ventral scutes varying between 180 and 212; anal entire; subcaudals double, exceptionally confluent into a single series. The maxillary series of teeth is formed by from ten to twelve teeth, the front teeth being the smallest; they increase in strength towards the middle of the bone, one or two before the penultimate being again smaller; the penultimate is sometimes as long as, sometimes a little longer than, the middle, sometimes not separated by an interspace from the preceding, sometimes separated by a very small space only; the last tooth generally, again, is small: it is not rarely altogether doubtful whether the dentition of a specimen should be considered diacranterian or syncranterian; but it is never lycodont.

The coloration is very uniform, above dark, below lighter, the dark colour sometimes descending on the scutes, the light sometimes

ascending on the sides. Specimens from Ceram and Amboyna show generally a light colour.

To this species I refer now the following Snakes, described by various authors:—

1837. *Lycodon modestus*, Schleg. Essai ii. p. 119; from Amboyna.
1854. *Lycodon modestum* and *L. lividum*, Dum. & Bibr. pp. 380 and 381; from Amboyna and Pulo Samao.
1861. *Ablabes greineri*, Bleeker, Rept. of Amboyna; from Amboyna.
1861. *Coronella rosenbergii*, Bleeker, Rept. of Ceram; from Ceram.
1863. *Lielaphis holochrous*, Günther, P. Z. S. p. 59; from Ceram.
1874. *Lycodon aruensis*, Doria, Ann. Mus. Gen. p. 352; from the Aru Islands.

The specimens which I have examined are from Ceram, Mysol, and Amboyna; and they differ less among each other than the two specimens from the Duke-of-York Island. Both have a syncranterian dentition (ten teeth); but one has eight upper labials, all the subcaudals divided, and 197 ventrals; the other has seven upper labials, 180 ventrals, and, singularly enough, only the first two and the last nineteen subcaudals divided, the sixty-three middle ones being entire.

Other species belong to the same genus, and one or the other may eventually prove to be identical with the one described, viz.:—

Lielaphis batjanensis, Gthr., from Batjan.

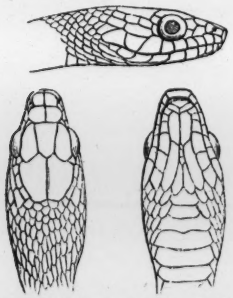
Zamenophis australis, Gthr., from Cape York, with which *Lycodon keyensis* of Doria, from the Key Islands, appears to be identical.

Lycodon parvus, Meyer, from Jobi.

TROPIDONOTUS HYPOMELAS, sp. n.

Body very slender; head moderately long and deep; eye large;

Fig. 1.



Head of *Tropidonotus hypomelas*.

scales in seventeen rows, all keeled; ventrals 196, anal bifid; subcaudals 99; anterior frontals truncated in front; loreal as high as long; two præoculars, the upper just reaching to the upper surface of the head; three postoculars, the lower of which is the narrowest and smallest; 9 upper labials, the fifth and sixth entering the orbit; temporals 2+3, the two anterior in contact with the postocular. The dentition is syncranterian, almost isodont. Upper parts brownish olive, with small blackish and whitish spots longitudinally arranged. Lower part of the anterior half of the trunk whitish, with a series of black spots along the median line of the abdomen, each scute having a black spot. In the middle of the length of the trunk the dark colour of the sides gradually encroaches on the scutes, which, on the hinder half of the body and on the tail, are uniform blackish.

One specimen, thirty-two inches long, the length of the tail being nine inches.

DENDROPHIS MACROPS, sp. n.

This Snake is distinguished from *Dendrophis solomonis* by its large eye, the diameter of which exceeds its distance from the nostril. Scales in thirteen rows; loreal large, longer than high; eight or nine upper labials, two of which enter the orbit; one præocular

Fig. 2.



Head of *Dendrophis macrops*.

not extending to the vertical; two postoculars; temporals irregularly arranged, 2+2+2; ventrals 195, strongly keeled; subcaudals 140; vertebral scales of moderate size; upper parts uniform olive-coloured; scales with an elongate white spot on the outer margin; upper part of head brownish olive; lower parts uniform greenish.

One specimen, forty-six inches long, the tail being fourteen inches.

EREBOPHIS, g. n. *Erycid.*

Body stout and thick, covered with short scales, which are arranged in numerous rows, and provided with exceedingly strong keels. Head resembling that of a Crotaline snake, covered above and on the side with numerous scales; rostral flat, truncated, oblique, not extending to the upper surface of the snout; nostril very small, in the middle of an oblong shield; eyes small, surrounded by small scales; ventrals rather narrow; tail very short, slightly prehensile, with a single series of subcaudals; teeth in both jaws numerous, the anterior of the maxillary, mandible, and palatine bones much enlarged; tongue remarkably slender; no rudiments of hind limbs.

EREBOPHIS ASPER, sp. n. (Plate XXI.)

The head of this singular Snake is subtriangular, with high subvertical sides, swollen behind and covered with small, obtusely keeled scales; snout truncated in front, with a distinct canthus rostralis, the nasal plate being immediately below the canthus. Ten or eleven low labial shields form the margin of the upper lip, and are covered with minute tubercles. The skin behind the eye forms a fold with a more or less distinct hollow below it. Thirteen lower labials; gular scales in many series.

The body is very thick and short, distinctly compressed. The scales are short and rounded behind, thick and provided with a strong keel, forming in the middle of the body about forty-one longitudinal series. The longitudinal series do not run parallel to the vertebral line, but gradually descend backwards towards the belly. The three or four outer series of scales are smooth, the outermost being the largest. Ventrals 146; subcaudals 20.

Upper parts dark brown, with indistinct patches of lighter brown. All the lower parts and the smooth lateral series of scales yellowish.

Only one specimen of this highly interesting Snake is in the collection; it is twenty-nine inches long, the head measuring $1\frac{3}{8}$ inch, and the tail two inches.

BATRACHIANS.

PLATYMANTIS PLICIFERA, Gthr.

Singular as it may appear, the *Platymantis* of Duke-of-York Island is not identical with *P. vitiana* from the Fiji Islands, but with *P. plicifera* from the Philippines. If single examples had been examined, slight differences in the form of the foremost part of the snout and in the length of the hind limb might have been regarded as indicative of specific distinctness; but they prove to be merely individual when the whole series of specimens (five from Duke-of-York Island and six from the Philippines) is examined.

FISHES.

The species sent by Mr. Brown are twenty-five in number, belonging to the most common forms generally distributed over the tropical parts of the Indo-Pacific region; and as they evidently form but a very small proportion of the fish-fauna of this archipelago, an enumeration of the species would add nothing to our knowledge. However, the collection contained a specimen of *Histiopterus typus* (Schleg.), a species hitherto believed to be peculiar to the Japanese seas, and represented on the eastern and southern coasts of Australia by *H. labiosus* and *H. recurvirostris*.

5. On a Collection of Crustacea made by the Rev. G. Brown, C.M.Z.S., on Duke-of-York Island. By Edward J. Miers, F.L.S., F.Z.S., Assistant in the Zoological Department, British Museum.

[Received February 19, 1877.]

The Crustacea collected by Mr. Brown belong, with one exception (*Lysiosquilla maculata*), to the Decapoda, and amount in all to forty-four specimens, representing sixteen species. Although none of the species collected are new to science, several are interesting and little-known forms. I may particularly mention the *Grapsodes notatus* of Heller, originally described from specimens collected by the Novara Expedition at the Nicobars, and peculiar on account of the form of the carapace and structure of the orbital region; and the *Sesarma rotundata* of Hess, hitherto recorded only from Sydney, New South Wales.

I have added a description of a remarkable species of *Sesarma* (*S. tæniolata*) in the British-Museum collection. The majority of the species collected by Mr. Brown are well-known forms, and generally distributed throughout the Indo-Pacific region.

Atergatis floridus.

Cancer floridus, Linn. Syst. Nat. (ed. xii.) p. 1041 (1766).

Cancer ocyroë, Herbst, Naturg. Krabben u. Krebse, iii. (part 2) p. 20, pl. liv. fig. 2 (1801); M.-Edw. Hist. Nat. Crust. i. p. 375 (1834).

Atergatis floridus, De Haan, Faun. Japon. Crust. (Dec. ii.) p. 46 (1835); A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. i. p. 243 (1865).

One example, a female, of this very common and widely distributed Indo-Pacific species is in the collection.

Carpilius convexus.

Cancer convexus, Forskål, Descript. Animalium &c., Insecta, p. 88 (1775).

Carpilius convexus, M.-Edw. Hist. Nat. Crust. i. p. 382, pl. xvi. figs. 9 & 10 (1834); A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. i. p. 215 (1865).

Two specimens, both females, are in the collection. This is also a very common species, and generally distributed throughout the Indo-Pacific region. In *C. convexus* the abdomen of the male is 6-, of the female 7-jointed; but in the males a small marginal fissure is usually to be observed on each side of the abdomen, marking the line of coalescence of the third and fourth segments. In the females the right chela is usually very large and massive.

ETISUS DENTATUS.

Cancer dentatus, Herbst, Naturg. Krabben u. Krebse, i. p. 186, pl. xi. fig. 66 (1790).

Etisus dentatus, M.-Edw. Hist. Nat. Crust. i. p. 411 (1834).

One specimen, a female with ova, is in the collection. This is another widely distributed species. Specimens are in the British-Museum collection from the Mauritius, Torres Straits, and New Caledonia.

ACTÆODES TOMENTOSUS.

Zozymus tomentosus, M.-Edw. Hist. Nat. Crust. i. p. 385 (1834); Règne Animal de Cuvier, Atlas, pl. xi. *bis*, fig. 2.

Actæodes tomentosus, Dana, U.S. Expl. Exp. xiii. Crust. i. p. 197 (1852).

Actæa tomentosa, A. M.-Edw., Nouv. Archiv. Mus. Hist. Nat. i. p. 262 (1865).

Four specimens of this species, all of them males and three of large size, were collected. Length of largest specimen $\frac{5}{8}$ inch, greatest breadth $1\frac{1}{3}$ inch. Like most of the species collected, this is a very common Indo-Pacific species.

I may here observe that M. A. Milne-Edwards, in his revision of the Cancridæ (Nouv. Arch. Mus. Hist. Nat. i. p. 259, 1865), has united the genera *Actæa* and *Actæodes*, not considering the excavate or non-excavate finger-tips a character of generic importance. Dana, on the other hand (Expl. Exp. Crust. i. p. 147, 1852), has based his subfamilies Xanthinæ and Chlorodinæ upon this very peculiarity of structure, and has shown that the genera may be arranged in each division in two parallel series. I am inclined to think the latter the most natural and convenient arrangement of the genera; but it will probably be necessary, if Dana's system be adopted, to unite the subfamilies Cancrinæ and Xanthinæ, as the genus *Cancer* bears nearly the same relation to *Etisus* in the Chlorodinæ, as *Liomera* to *Carpilodes*, or *Xantho* to *Leptodius*.

LEPTODIUS EXARATUS, var. SANGUINEUS, Milne-Edwards.

? *Chlorodius sanguineus*, Milne-Edwards, Hist. Nat. Crust. i. p. 402 (1834); Dana, U.S. Expl. Exp. xiii. Crust. i. p. 207, pl. xi. fig. 11 (1852).

Chlorodius nodosus, Randall, Journ. Ac. Nat. Sci. Phil. p. 111 (1839); Dana, U.S. Expl. Exp. xiii. Crust. i. p. 210, pl. xi. fig. 14 (1852).

? *Leptodius sanguineus*, A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. ix. p. 224 (1873).

Five males and one female specimen of a *Leptodius* were collected, which I should have referred, without any doubt, to the *Chlorodius sanguineus* of Milne-Edwards, were it not that M. Alphonse Milne-Edwards in his description says:—"*Jamais il n'y a de tubercules sur les parties saillantes.*" In the specimens before me there is a slight tubercle on the carapace behind each tooth of the antero-

lateral margins. The *Chlorodius nodosus* of Randall, as figured by Dana (*l. c.*), is evidently the same species and variety as the specimens from Duke-of-York Island, and is not, I think, distinct from *C. sanguineus* as figured by the same author. The principal character that differentiates this variety from the typical *exaratus* is the presence of an additional small tooth behind the last tooth of the antero-lateral margins. *C. sanguineus* is considered a distinct species by Dana, and, with some hesitation, by A. Milne-Edwards, but was united with *C. exaratus* by Stimpson in his preliminary "Report on the Crustacea collected by the United-States Expedition to the North Pacific" (Proc. Ac. Nat. Sci. Phil. p. 34, 1858).

Ozius rugulosus.

Ozius rugulosus, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 34 (1858); Heller, Voy. Novara, Crust. p. 22, pl. iii. fig. 1 (1865); A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. ix. p. 240, pl. xi. fig. 3 (1873).

Three specimens of this species are in the collection—two females and a young male. Specimens are in the British-Museum collection from the Mauritius, Australian coast, and New Hebrides; and it has been recorded from the Nicobars, Bonin Islands, Tahiti, and New Caledonia. Thus it is evident that its range extends over the whole Indo-Pacific region; but it is probably nowhere a common species.

Eriphia lævimana.

Eriphia lævimana, M.-Edw. Hist. Nat. Crust. i. p. 427 (1834); Dana, U.S. Expl. Exp. xiii. Crust. i. p. 249, pl. xiv. fig. 7 (1852); A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. ix. p. 255 (1873).

Two males and four females were collected by Mr. Brown. In the young animal the series of tubercles upon the frontal margin are not developed, the margin appearing subentire; but those on the postfrontal region and antero-lateral margins are clearly distinguishable. *E. lævimana* is distributed throughout the Indo-Pacific region; there are specimens in the collection of the British Museum, from Madagascar and the Mauritius, that certainly belong to this species, and not to the allied *E. smithii* of M'Leay (*Annulosa* in Smith's Zool. S. Africa, p. 60), figured by Krauss (Süd-Afrikan. Krust. p. 36, pl. ii. fig. 3, 1843), of which specimens, from Port Natal, are in the Museum collection.

Ocypode ceratophthalma.

Cancer ceratophthalmus, Pallas, Spic. Zool. ix. p. 83. pl. v. figs. 7, 8 (1772).

Ocypode ceratophthalma, Fabr. Ent. Syst. Suppl. p. 347 (1798); M.-Edw. Hist. Nat. Crust. ii. p. 48 (1837); Règne Animal de Cuvier, Atlas, Crust. pl. xvii. fig. 1; Ann. Sci. Nat. (Sér. 3) Zool. xviii. p. 141 (1852); A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. ix. p. 270 (1873).

In the collection are two specimens of an *Ocypode*, males, and both in a mutilated condition, which I refer to this species. In both specimens are to be seen the large orange-red blotches on the sides

and back of the cardiac region which always characterize *O. ceratophthalma*. The terminal spines of the eyes in one specimen are quite short; in the other specimen they are longer, but not one third of the total length of the eye. Occasionally they are very greatly elongated; and evidently their length is of no value as a specific character. *O. ceratophthalma* is a very common and generally distributed Indo-Pacific species.

GRAPSUS STRIGOSUS.

Cancer strigosus, Herbst, Naturg. der Krabben und Krebse, iii. (part 1) p. 55. pl. xlvii. fig. 7 (1799).

Grapsus strigosus, Latr. Hist. Crust. et Ins. vi. p. 70 (1803); M.-Edw. Hist. Nat. Crust. ii. p. 87 (1837); Ann. Sci. Nat. Zool. (Sér. 3) xx. p. 169 (1853); A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. ix. p. 286 (1873), *ubi synon.*

Two specimens, a male and a female with ova, both in an imperfect condition, are in the collection. M. Alphonse Milne-Edwards (*l. c.*) has excellently summarized the characters which distinguish this common and variable species from the closely allied and still more common and variable *G. pictus*, and has indicated the synonymy of each species.

G. strigosus is distributed throughout the Indo-Pacific region, and is even (as is also *G. pictus*) found on the western coast of the American continent.

GRAPSODES NOTATUS.

Grapsodes notatus, Heller, Reise der Novara, Crust. p. 58, pl. v. fig. 2 (1865).

Three specimens, a young male and two females, are in the collection, which, I think, belong to this species. Dr. Heller's specimens were from the Nicobars; both the genus and species are unrepresented in the collection of the British Museum. The antero-lateral margins are described as 3-toothed, as are those of the specimens from Duke-of-York Island (including the external orbital tooth); in the figure of *G. notatus* there is an additional small antero-lateral tooth: this is probably an error of the draughtsman. As in the allied genus *Nectograpsus*, there is a wide hiatus between the outer orbital tooth and the suborbital lobe; this is mentioned in Dr. Heller's description, but not properly represented in the figure. Dr. Heller's genus *Grapsodes* is evidently very nearly allied to *Nectograpsus* of the same author, principally differing in the existence of antero-lateral marginal teeth. The two genera, in fact, bear the same relation to one another in the subfamily Sesarminæ as do certain species of *Chasmagnathus* to *Cyclograpsus* in the Grapsinæ.

SESARMA ROTUNDATA.

Sesarma rotundata, Hess, Archiv. f. Naturg. xxxi. p. 149, pl. vi. fig. 9 (1865).

Three specimens of this species, all of them males, are in the collection. *S. rotundata* belongs to the section of the genus in

which the lateral margin of the carapace is 3-toothed, and is distinguished by the peculiar convexity of the hepatic regions, and the granulation of the front part of the carapace, and the anterior legs. The ambulatory legs are long and slender, the last joint much shorter than the preceding. The specimen described by Hess was from Sydney, New South Wales; and specimens are in the British-Museum collection from the Fiji Islands (Nairai) and Eastern seas.

I subjoin the description of a species in the British-Museum collection[1].

SESARMA (HOLOMETOPUS) AUBRYI.

Sesarma (*Holometopus*) *aubryi*, A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. Bulletin, v. p. 29 (1869); ix. p. 307, pl. xvi. fig. 3 (1873).

Six specimens, four males and two females, of which one bears a considerable quantity of ova, were collected. They agree in all particulars with A. Milne-Edwards's description of the species, based upon specimens collected at New Caledonia, except that in the figure of the abdomen, probably that of a male, the sides are represented nearly straight, and the terminal joint as broad at base as the preceding; whereas in the specimens from Duke-of-York Island (as is usual in *Sesarma* and the allied genera) the terminal abdominal joint is much smaller than the preceding at its base.

In the *Sesarma* (*Pachysoma*) *hæmatocheir* of De Haan (Faun. Japon. Crust. p. 62, pl. vii. fig. 4), upon which Milne-Edwards founded the genus *Holometopus*, the front is broader in proportion to its depth, the abdomen has the sides more decidedly concave, and the terminal joint longer; the differences between the two species, however, are very slight, and may depend upon the age of the specimen.

CARDISOMA CARNIFEX.

Cancer carnifex, Herbst, Naturg. Krabben u. Krebse, i. p. 163, pl. xli. fig. 1, ♂ (1796).

[1] SESARMA TÆNIOLATA.

Sesarma tæniolata, White, List Crust. Brit. Mus. p. 38 (1847), sine descr.

Carapace quadrate and very convex, the groove defining the gastric region deep, the lateral margins with two prominent teeth (including the external orbital tooth). Front nearly vertically deflexed, the anterior margin sinuated, the median sinus wide; postfrontal lobes four, not very abrupt; carapace behind the lobes slightly granulated. Anterior legs robust; arm with a very strong tooth near the distal extremity of its upper margin; wrist closely covered with granules or small tubercles, each of which is itself crenulated; hand granulated externally, and with a strong granulated ridge on its inner surface; upper margin with a *longitudinal*, comb-like, closely pectinated ridge; mobile finger with a longitudinal ridge on its upper surface marked with about sixty transverse striæ. Ambulatory legs compressed and slightly hairy. Abdomen of male with the last joint not half the width of the preceding. Length and breadth of carapace about $1\frac{3}{8}$ inch.

Hab. Philippine Islands (*Cuming*, coll. Brit. Mus.).

This species is allied to *S. tetragona*, Fabr., but is distinguished from it by the curious longitudinal comb-like ridge on the upper margin of the hand and the transversely striated ridge on the mobile finger.

Cancer hydromus, Herbst, *l. c.* p. 16, pl. xli. fig. 2, ♀ (1796).
Cardisoma carnifex, Latr. Encycl. Méth. Hist. Nat. x. p. 685 (1825); M.-Edw. Hist. Nat. Crust. ii. p. 23 (1837); A. M.-Edw. Nouv. Arch. Mus. Hist. Nat. ix. p. 264 (1873).

In the single imperfect specimen (male) of this species in the collection a very small tooth exists at some distance behind the external orbital angle; the raised line defining the antero-lateral margins is continued but a short distance backward beyond this tooth; the left anterior leg is the larger; the ambulatory legs are clothed with long hairs.

PAGURUS PUNCTULATUS.

Pagurus punctulatus, Olivier, Encycl. Méth. viii. p. 641 (1811); M.-Edw. Hist. Nat. Crust. ii. p. 222 (1837).

A single specimen of this very common species is in the collection, a female, inhabiting the shell of *Dolium perdix*.

White, in the 'List of Crustacea in the Collection of the British Museum,' p. 60, adopts Herbst's earlier name of *Cancer megistos* for this species; but, as the description and figure of *C. megistos* are wanting in the only copy of Herbst's work that I have seen, I retain for the present Milne-Edwards's designation of *Pagurus punctulatus*, by which this species is generally known.

PARRIBACUS ANTARCTICUS.

Scyllarus antarcticus, Lund, Skrivt. Naturh. Selsk. Kjöben. Bd. ii. Heft 2, p. 22 (1793); Fabr. Ent. Syst. Suppl. p. 399 (1798).
Ibacus antarticus, M.-Edw. Hist. Nat. Crust. ii. p. 287 (1837).
Parribacus antarcticus, Dana, U.S. Expl. Exp. xiii. Crust. i. p. 517, pl. xxxii. fig. 6 (1852).

Two specimens, a male and a female, were collected. The male has the appendages (pleopoda) of the second and third abdominal segments much larger than those of the female, foliaceous, and equally developed; in those of the fourth and fifth segments the inner ramus is rudimentary. In the female the third, fourth, and fifth segments have the inner ramus of the appendages produced, substyliform, and two-jointed at its extremity.

LYSIOSQUILLA MACULATA.

Squilla maculata, Fabr. Ent. Syst. ii. p. 511 (1793); Lamarck, Hist. Ann. sans Vert. v. p. 188 (1818); M.-Edw. Hist. Nat. Crust. ii. p. 518 (1837).
Cancer (*Mantis*) *arenarius*, Herbst. Naturg. Krabben u. Krebse, ii. p. 96, pl. xxxiii. fig. 2 (1796).

One specimen, a male, of this common Indo-Pacific species is in the collection. It is of rather small size (about 8 inches). This species, when fully grown, is probably the largest of the genus.

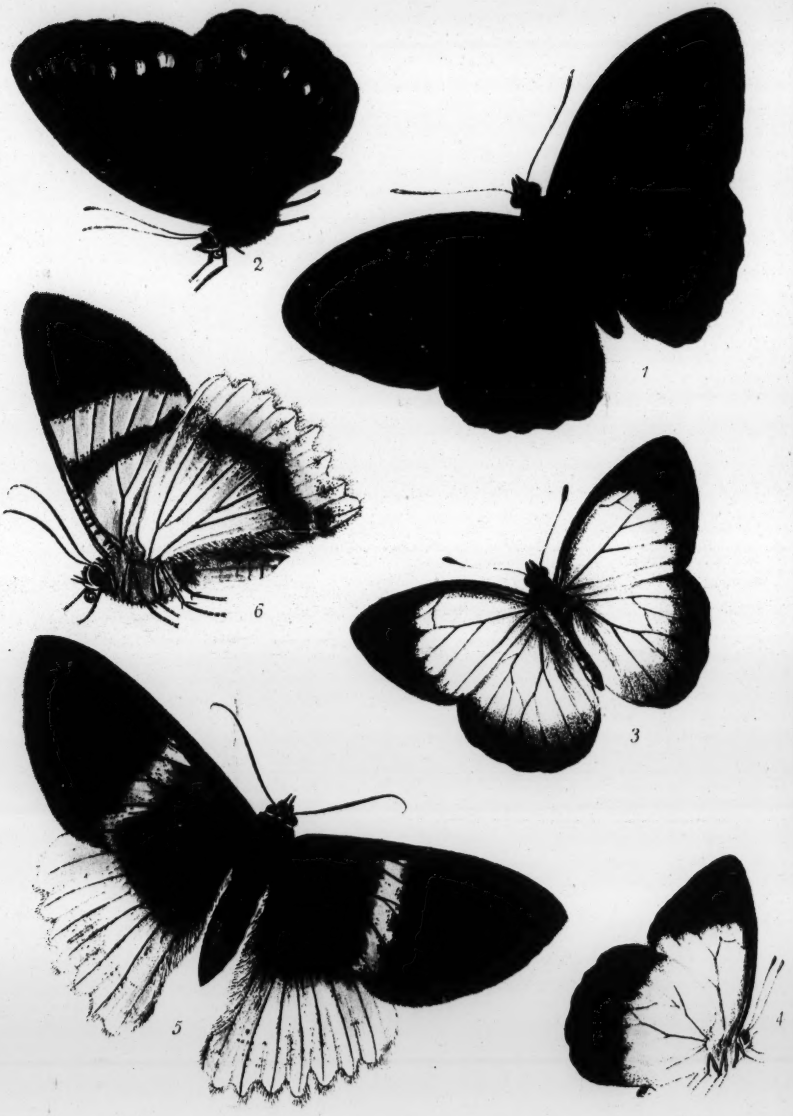


Hobern. & F. R. pinx. del. et lith.

M&N Hanhart imp.

NEW LEPIDOPTERA FROM DUKE OF YORK ISLAND.

MUSEUM



Robert. H.F. Rippon, del. et lith.

M&N Hanhart imp.

NEW LEPIDOPTERA FROM DUKE OF YORK ISLAND

6. Note on the Echinodermata sent by the Rev. G. Brown from Duke-of-York Island. By Edgar A. Smith, F.Z.S.

[Received February 19, 1877.]

The three species of Echinodermata in the collection made by the Rev. G. Brown are all common well-known forms, and have been recorded previously both from the Indian and Pacific Oceans.

Asteridæ.

1. Scytaster variolatus, Retzius.

Other localities are Zanzibar, Bourbon, Mauritius, Rodriguez, New Caledonia.

2. Gymnasteria carinifera, Lamarck.

This species has been brought from the Red Sea, Indian Ocean, Torres Straits, and Sandwich Islands.

Ophiuridæ.

3. Ophiocoma erinaceus, Müller & Troschel.

Found also in the Red Sea, at Mozambique, Zanzibar, Rodriguez Island, Sandwich Islands, Society Islands, &c.

7. On a Collection of Lepidoptera made by the Rev. G. Brown on Duke-of-York Island and its Neighbourhood. By Osbert Salvin, F.R.S., and F. DuCane Godman, F.Z.S.

[Received February 2, 1877.]

(Plates XXII. & XXIII.)

The collection of Butterflies made by Mr. Brown on Duke-of-York Island and the neighbouring islands of New Britain and New Ireland contains examples of 26 genera and 40 species, while in that of the Moths there are examples of 11 genera represented by 14 species.

As might be expected from the close proximity of these islands to New Guinea, the Lepidopterous fauna partakes of the character of the larger island; for, putting aside such widely ranging genera as *Danais*, *Euplœa*, *Mycalesis*, &c., the presence of an *Ornithoptera* belonging to the *O. priamus* group, of *Papilio euchenor* and of a species of the *P. ulysses* group, as well as the absence of any thing like generic peculiarity, shows quite clearly where the relationship of the fauna lies, at least as regards the Butterflies.

With the islands of the South Pacific which lie further to the eastward and south-eastward, the Butterfly-fauna of which is slowly being brought to light, the connexion of New Britain and New Ireland is not so intimate.

Mr. Butler (P. Z. S. 1874, p. 274 *et seq.*) has recently published a list of the species described up to that date from the South-Sea Islands;

to this he has since made some additions (P. Z. S. 1875, p. 610). In this list he includes the species mentioned by Montrouzier in his article on the Butterflies of Woodlark Island, and also the few included in 'The Entomology of the Voyage of the 'Coquille,'' from New Ireland. But Woodlark Island is very properly included in the Papuan fauna by Mr. Wallace; and New Ireland also belongs to the same fauna, as seems evident from the present collection.

At least 27 species are included in Mr. Butler's list from these localities; and deducting them from the total of 104 species, we have 77 as the number of species at present known to inhabit the South-Sea Islands beyond the immediate influence of New Guinea. To these must be added the 23 additional species mentioned in Mr. Butler's second paper, making a total of 100. Very much remains to be done before any thing like a complete knowledge of the Butterflies of the South-Sea Islands is acquired; but it would seem that these islands can hardly fail to present a comparatively poor Lepidopterous fauna; and, judged by this standard, New Britain and the adjoining islands certainly cling to the richer fauna of New Guinea.

Of the genera in the present collection not found in the South-Sea Islands proper, we have *Cynthia*, *Rhinopalpa*, *Cethosia*, *Cyrestes*, *Minetra*, *Pithecops*, and *Ornithoptera*; whilst, of the remainder, *Drusilla* is a very characteristic New-Guinea form, represented in Otaheite by a single species, and the rest are all more or less widely ranging genera.

It is unfortunate that in making this collection Mr. Brown has not noted the particular island where each specimen was captured. The presence in it of two such distinct species of *Ornithoptera* as *O. aruana* and *O. urvilliana* is suggestive; and it seems very probable that the former was obtained in New Britain and the latter in New Ireland. As *O. aruana* has a very wide range, and the latter, as far as we yet know, an extremely limited one, it seems quite possible that the faunæ of these two islands may differ more *inter se* than might be expected from the proximity of the two shores. We hope that Mr. Brown will be able to clear up this point, as it is one well worthy of investigation.

A considerable number of the species in the present collection differ in a slight degree from their representatives from Western New Guinea and the adjoining islands. This is hardly surprising, seeing the wide interval of several hundred miles which intervenes between New Britain and the point previously investigated. Some of these races we have described in the present paper; others we leave until the receipt of additional specimens shows more clearly the extent to which they differ.

The nearest point to New Britain which has had its Butterflies examined is Woodlark Island. This island is situated on the north side of the Louisiade archipelago, in about 9° S. lat., and 153° E. long. It remained undiscovered until 1836, but has since been visited by French missionaries, one of whom, M. Montrouzier, having made a small collection of Butterflies, described them in 1856 in the 'Annales des Sciences Phys. et Nat. de Lyon,' Unfor-

tunately the species there mentioned are, many of them, at present unknown to our collections; but the paper is one that has an important bearing upon the nomenclature of the Butterflies of the eastern end of New Guinea and of the islands which lie beyond.

In concluding these preliminary notes, we offer our thanks to Mr. A. G. Butler of the British Museum for his assistance in enabling us to compare our specimens with those in the national collection, and for his help in several matters connected with the subject of this paper.

RHOPALOCERA.

NYMPHALIDÆ.

DANAINÆ.

1. DANAIS AUSTRALIS.

Danais australis, Hombr. & Jacq. Voy. Pôle Sud, Zool. iv. p. 388, Atlas, t. 2. f. 5, 6 (N. Australia).

The specimens sent (three in number) seem to agree better with the figure quoted above than with any other of the many local forms into which the widely ranging *D. limniace* (L.) has been divided. The hind wings have their distal halves of a paler brownish tint, and in this respect resemble the race described by Mr. Butler (Ent. Month. Mag. xi. p. 163), from New Guinea (Dorey), as *D. leucoptera*.

2. DANAIS SOBRINA.

Danais sobrina, Boisd. Voy. Astr. Entom. p. 103, Atlas, t. 4. f. 3 (Bouru and New Guinea).

The single specimen in the collection only differs from the plate quoted above in having the spots of both wings rather larger.

3. EUPLŒA UNIBRUNNEA, sp. n.

♂ Exp. 4·9. Form similar to that of *E. prothoë*, Godt. Above uniform brown, except the granular patch and the portion of the hind wings covered by the fore wings, which are yellowish white: beneath brown, fore wings with a submarginal row of minute bluish-white spots and two larger ones, extracellular, one on each of the median interspaces; hind wings with a marginal row of similar spots, which become evanescent towards the anal angle; at the apical angle is another row of four spots inside the first row; a row of seven spots surrounds the outside of the upperside and distal end of the cell; and, lastly, one is situated inside the cell close to the distal end. There are a pair of preocular spots, a pair of supraocular, a pair on the prothorax, and one on each of the wing-coverts.

Obs. Allied to *E. semicirculus*, Butl. (*E. cuvieri*, Feld.), but differing in the absence of all spots on the upper surface of the wings.

A large and apparently well-marked species, of which Mr. Brown's collection contains two examples. The second specimen has a pinkish-white tinge on the cell of the primaries.

4. EUPLŒA BROWNI, sp. n. (Plate XXII. figs. 1, 2.)

♂ Exp. 4·75. Form similar to that of *E. prothoë*, Godt. Above uniform pale creamy buff with opalescent reflexions; the costa and outer margin of the anterior wings dark brown, the veins in both wings also dark brown, and the granular patch of the hind wings dark buff; beneath as above, both wings gradually shaded into tobacco-brown towards their bases; there are faint outlines of spots along the outer margin of the anterior wings, and others in a curve across the apex of both wings, also between the costal and radial nervules and one at the distal end of the cell.

The colour of this remarkable species distinguishes it at once from all members of the genus. It is one of the finest novelties in Mr. Brown's collection; and we have much pleasure in naming it after him.

5. EUPLŒA TREITSCHKII.

Euplœa treitschkii, Boisd. Voy. Astr. Ent. p. 98; D. & H. Gen. Diurn. Lep. t. 11. f. 2.

Originally described from specimens obtained at Port Praslin, New Ireland. The single example sent agrees closely with the plate cited above, but differs in having more spots in the central area of the hind wings.

6. HAMADRYAS ÆQUICINCTUS, sp. n.

Exp. 2·2. Closely allied to *H. zoilus* (Fab.), from which it only differs in having the white spot of the hind wings nearly circular, the black margin being of equal width round the apical angle and outer margin, gradually tapering along the inner margin towards the base of the wing.

Of the several closely allied races of *H. zoilus*, this seems most entitled to separation; still it must be admitted that the relationship is by no means remote.

There are two specimens in the collection, agreeing with one another in the character pointed out above.

SATYRINÆ.

7. MYCALESIS LUGENS.

Mycalesis lugens, Butler, P. Z. S. 1875, p. 612.

Agrees with the type in the British Museum, which was procured by Mr. Wykeham Perry on Vaté Island, New Hebrides.

8. MYCALESIS FLAGRANS.

Mycalesis flagrans, Butler, Ann. & Mag. N. H. ser. 4, xviii. p. 243.

The specimen sent agrees very closely with the types of the species described by Mr. Butler (*l. c.*) as *M. flagrans*.

9. MYCALESIS MEDUS.

Mycalesis medus (Fab.), Butl. Cat. Satyridæ, p. 139.

Agrees with Bornean and New-Guinea specimens in the British Museum.

Morphinæ.

10. Drusilla anableps.

Drusilla anableps, Voll. Tijdschr. v. Entom. iii. p. 40, t. 1. f. 3, and t. 2. f. 1 (1860) (Otaheiti).

Mr. Brown has sent four specimens of *Drusilla*, one male and three females. The male and one of the females agree closely with Vollenhoven's Plate, and seem to represent the true *D. anableps*. The other two females offer a certain amount of variation, of which we are not yet able to ascertain the value. It may be that the specimens of *D. anableps* were taken on one island, and the other two females upon another; but on this point we have as yet no information. In order to draw attention to these aberrant specimens, we append a description of one of them.

Exp. 4·3. Dark brown, an oval white spot between the end of the cell of the anterior wings and the anal angle, but nowhere touching the outer or the inner margin; hind wings with a similar lunate spot, the horns clasping a large ocellus composed of an outer dark margin surrounding a circle of pale fawn-colour, having a black pupil pierced with a white spot: beneath as above, the white spot of the anterior wings being rather larger; the posterior wings have in addition an ocellus near the apical angle, round the inner margin of which the white patch is extended in a narrow curved line.

Nymphalinæ.

11. Cynthia insularis, sp. n.

♀ Exp. 4·4. An insular race of *C. juliana* (Cr. Pap. Ex. t. 280. f. A, B) from Amboyna, differing chiefly in the position of the white band, which in *C. juliana* crosses the hind wings inside the ocelli. In the present insect this band passes through and outside these ocelli, and between it and the outer margin of the wing are two submarginal dark undulating lines separated by whitish lunules. The general colour of the base of the wings is rich brown, without any greenish tinge; beneath, the principal band which crosses the hind wings is straighter and broader than in *C. juliana*, and dark brown instead of black.

A single female (the sex by which the races of *Cynthia* are most easily distinguishable) is in the collection. We have also compared it with the type of *C. ada*, Butl. P. Z. S. 1873, p. 686, ex Queensland, and find it distinct.

12. Rhinopalpa algina?

Vanessa algina, Boisd. Voy. Astr. Entom. p. 122; Hombr. & Jacq. Voy. Pôle Sud, Zool. iv. p. 390, Atlas, t. 2. f. 8, 9 (Triton Bay, New Guinea).

The single specimen sent has the fulvous transverse band of the anterior wings nearly straight, and thus resembles the figure cited above. In this respect it differs from *R. amelia*, Guér. (Voy. Coq. Zool. p. 278, t. 14. f. 1), where this band is distinctly angulated, as

in *R. sabina*, Cr. (Pap. Ex. t. 289. f. A–D)[1]. The spots near the apex of the wing are white, not fulvous, and are situated further from the costa than in Hombron and Jacquinot's plate. The specimen is not in good condition; and the examination of more examples may prove that the species is really distinct from any of those above mentioned.

13. JUNONIA VELLIDA.

Papilio vellida, Fab.; Donov. Ins. N. Holl. t. 25. f. 3.

A single specimen of this widely ranging species is in the collection.

14. CETHOSIA OBSCURA.

Cethosia obscura, Guér. Voy. Coq. Zool. p. 277, t. 15. f. 4 (New Ireland).

Mr. Brown has sent two specimens of this rare species, which we believe has not been obtained since the voyage of the 'Coquille,' when specimens were taken at Port Praslin in New Ireland.

15. DIADEMA INEXPECTATA, sp. n.

♂ Exp. 3·4. Allied to *D. alimena* (L.), but differing in the much narrower band of blue which traverses both wings, and which becomes nearly obsolete as it turns towards the costa of the fore wings; beneath the fore wings are devoid of the blue patch which traverses the median nervules, the apex of the wings is darker, and an oblique band of spots which passes from the costa to beyond the cell is evanescent; the hind wings show only traces of the pale transverse band of *D. alimena*, and the submarginal spots are much larger; the basal portion of both wings is deeper red-brown.

The specimens of the widely ranging *D. alimena* are all fairly constant in their characters; and from them the male specimen in Mr. Brown's collection differs in the above particulars.

16. DIADEMA UNICOLOR, sp. n. (Plate XXIII. figs 1, 2.)

♂ Exp. 3·6. Above uniform dark brown; the margin of the secondaries hardly paler, with a narrow black submarginal line; a row of minute bluish spots parallel to the outer margin of both wings: beneath slightly paler; three bluish spots in the cell near the subcostal nervure, and a distinct row parallel to the outer margin; a marginal dark band with a central lighter band surrounds the outer margin of both wings.

Allied to *D. perryi*, Butl. (P. Z. S. 1875, p. 613, t. 67. f. 3), but differing in the uniformity of the colouring of the upper surface and the reduced size of the submarginal spots of both wings, and other characters.

This species seems to be separable from any yet described. We compared it with the type of *D. perryi*, and found that Mr. Brown's specimen differed in several particulars.

[1] The former of the last-named species is distinct from the latter, though placed together by Kirby (Cat. Lep. p. 192), as is quite apparent from a comparison of the two sufficiently accurate figures.

17. CYRESTIS FRATERCULA.

Exp. 2·2. Allied to *C. acilia*, Godt., from New Guinea, of which it is doubtless an insular race. The white band crossing both wings is comparatively narrow, and is drawn to a point at the costa of the anterior wings, and also as it approaches the anal angle of the hind wings. The fulvous patch at the same angle is restricted, and only surrounds the terminal ocellus. In this respect this race resembles *C. lælia*, Feld., and *C. strigata*, Feld., from both of which it differs in the pointed form of the transverse white band; beneath it resembles the race we believe to be *C. strigata* (exempl. in mus. nostr. ex Gilolo or Morty, *Wallace*), except that the white submarginal bands of the hind wings are all narrower.

Two specimens of this *Cyrestis* are in the collection, both alike as to their markings. Though, as we have already stated, but a race of *C. acilia*, it seems as much entitled to separation as several other races which have had names bestowed upon them.

18. MINETRA, sp.?

One imperfectly developed specimen of a *Minetra* probably indicates that a distinct race inhabits these islands; but it may be as well to defer characterizing it for the present, until more specimens come to hand. It most resembles specimens from Bouru and Ceram, collected by Mr. Wallace, and which are doubtless referable to the Amboyna species *M. sylvia* (Cram. Pap. Ex. t. 43. f. F, G).

19. DOLESCHALLIA BROWNI. (Plate XXII. figs. 3, 4.)

♀ Exp. 3·8. Allied to *D. australis*, Feld. (Voy. Nov. Lep. p. 405, t. 51. f. 1, 2), but larger; the inner edge of the terminal black portion of the primaries, instead of running nearly parallel to the outer margin, ends at the anal angle; a well-defined subtriangular black spot at the end of the cell: the secondaries have the two black spots as in *D. polibete*, Cr., but are without either white or blue centres. Beneath there are well-defined light marks across the cell, beyond it, and in the apical angle; the base of the secondaries has also two light spots of a violet tint; two ocelli on the secondaries beneath correspond to the black spots of the upper surface.

We have been unable to find any species exactly corresponding to this. It differs from all we have seen, in the black of the primaries ending at the anal angle instead of on the inner margin. Both the species recently described by Mr. Butler, *D. herrichii* and *D. montrouzieri* (P. Z. S. 1875, p. 612), the types of which we have examined, appear to be quite distinct from the present insect.

20. CHARAXES JUPITER.

Charaxes jupiter, Butler, Lep. Ex. p. 14, t. 5. f. 4, 7.

This handsome species, of which Mr. Brown has sent a single specimen, agrees well with Mr. Butler's figure cited above. The original specimen was obtained by Mr. Wallace at Dorey, New Guinea.

LYCÆNIDÆ.

21. LYCÆNA PHŒBE.

Lycæna phœbe, Murray, Ent. M. Mag. x. p. 107 (S. Australia).

A single specimen of a *Lycæna* closely resembles specimens in the British Museum bearing the above name.

22. LYCÆNA, sp. ?

A mutilated specimen of a pale blue species, perhaps allied to *L. cleodus*, Feld. (Voy. Nov. Lep. t. 34. f. 20, 21).

23. LAMPIDES BÆTICUS.

Papilio bæticus, L.

Of this widely ranging species Mr. Brown sends a single specimen.

24. LAMPIDES BERENICE.

Lycæna berenice, H.-Sch. Stett. ent. Zeit. 1869, p. 74.

A single specimen agreeing with specimens thus named in the British Museum.

25. SCOLITANTIDES CLEOTAS.

Polyommatus cleotas, Guér. Voy. Coq. p. 277, t. 18. f. 4.

A single specimen of this species, the first examples of which were obtained during the voyage of the 'Coquille' at Port Praslin, New Ireland. This specimen agrees with the plate quoted above as to the distribution of blue on the primaries, and thus shows that Mr. Butler was justified in separating the New-Hebrides species as *S. excellens* (P. Z. S. 1875, p. 616, t. 67. f. 1, 2).

26. PITHECOPS DIONISIUS.

Lycæna dionisius, Boisd. Voy. Astr., Ent. p. 82 (New Guinea).

A single specimen agreeing with a New-Guinea example obtained by Mr. Wallace.

PAPILIONIDÆ.

PIERINÆ.

27. TERIAS, sp. ?

A male and two females of a species closely allied to *T. candida* (Cr. Pap. Ex. t. 331. f. A), but differing in having a narrower black outer border, and in the greater extent of the black on the inner margin of the hind wings. The latter character is especally shown in the female, where the black extends over the base of the primaries. The specimens are not in very good condition, and we prefer waiting till we can examine more examples before describing the species.

28. ELODINA HYPATIA.

Elodina hypatia, Feld. Voy. Nov. Lep. p. 216 (New Guinea).

Three specimens, one male and two females, apparently belonging to this species.

29. PIERIS QUADRICOLOR, sp. n. (Plate XXIII. figs. 3, 4.)

♂ Exp. 2·6. Above white, both wings margined except on their inner border with black; inside the black border and the base of the wings greyish: beneath as above, except that there is no grey on the inner margin of the black border, and that the basal two thirds of the secondaries is yellow; the black border beneath is pure and without any spots or markings.

This appears to be a distinct species from any yet described. It belongs to the genus *Belenois* of Mr. Butler's arrangement of the Pieridæ, and is perhaps most nearly related to *P. affinis*, Voll., from Celebes.

30. CALLIDRYAS CROCALE.

Papilio crocale (Cr.).

A single female specimen, apparently of this species.

PAPILIONINÆ.

31. ORNITHOPTERA ARUANA.

Ornithoptera aruana, Feld. Wien. ent. Monatschr. iii. p. 391.
Papilio aruana, Feld. Voy. Nov. Lep. p. 3, t. 1.

Specimens sent by Mr. Brown agree best with our Aru examples of *O. aruana*. They have the same pointed apex to the secondaries; the yellow spots on the same wings, seen in some species of this group, are also absent; but the black spot between the first and second median branches is absent in three out of four specimens; in the fourth it is quite small.

In endeavouring to determine these specimens we have had occasion to examine a tolerable series of the *Ornithopteræ* belonging to the *O. priamus* group; and our present conclusion is that but few of the species sought to be set up have any real specific value, and that their number will have to be considerably reduced whenever a full comparison of specimens is made. The characters of such so-called species as *O. triton*, *O. oceana*, *O. cassandra*, and others, being drawn from notoriously variable features, seem to fail in giving specific precision to the insects bearing them.

32. ORNITHOPTERA URVILLIANA.

Papilio urviliana, Guér. Voy. Coq. p. 273, t. 13. f. 1, 2.

The original specimens of this fine species were obtained at Port Praslin, New Ireland, during the voyage of the 'Coquille;' but from that time to the present nothing more has been known of the species. Mr. Brown now sends specimens of both sexes, the males agreeing accurately with the plate quoted above, the females being hitherto undescribed. The males present a slight amount of variation *inter se*, one having the characteristic blue markings rather purer than the other, in which a slightly greener tint prevails. But there can be no doubt of the complete distinctness of the species, and that, whatever may eventually be done with the many races of the *O.-pria-*

mus group, *O. urvilliana* will have to rank as a species at least as distinct as *O. crœsus*.

The female closely resembles that of *O. priamus* itself, being of a sordid brown colour, the light markings being also dingy and not well defined as in the female *O. aruana*. In form and position these marks correspond to those of the female *O. priamus*. The anal angle, however, is more produced, a character also shown in the male.

33. PAPILIO EUCHENOR.

Papilio euchenor, Guér. Voy. Coq. p. 273, t. 13. f. 3.

A species ranging widely over the whole of the New-Guinea area, but unusually constant in its characters, little or no variation being observable in specimens from distant points.

34. PAPILIO ——?

Two imperfect specimens of a *Papilio*, belonging to the *P. helenus* group, are in the collection. The species seems to be most nearly allied to that described by Mr. Wallace from New Guinea as *P. albinus* (Trans. Linn. Soc. xxv. p. 49, t. 5. f. 5); but there are several slight points of distinction, the investigation of which had best be deferred until the receipt of better specimens.

35. PAPILIO AGAMEMNON, L.

A *Papilio* of this form has been sent by Mr. Brown. It most resembles the "local form *b*" from Ké Island, mentioned by Mr. Wallace in his paper on the Papilionidæ of the Malayan Region (Trans. Linn. Soc. xxv. p. 67). The secondaries are wholly black, except a line which crosses the cell obliquely near its base; the second transverse band which crosses the primaries consists of five spots, instead of being a continuous line as is shown in the Ké-Island example, now in Mr. Druce's collection. The colour of the spots is greener, and the insect is much larger. It doubtless constitutes one of the numerous slight modifications, to use Mr. Wallace's words, in which *P. agamemnon* presents itself, and which were deemed by that writer to be hardly prominent enough to characterize as species.

36. PAPILIO CHOREDON.

Papilio choredon, Feld. Verh. zool.-bot. Ges. xiv. p. 306 (Australia).

Several mutilated specimens appear to belong to this race of *P. sarpedon*, L. It was, doubtless, the same race which was found by Montrouzier on Woodlark Island, and called by him *P. sarpedon* (Ann. des Scien. Phys. et Nat. de Lyon, viii. p. 401).

37. PAPILIO TELEMACHUS?

Papilio telemachus, Montr. Ann. des Sc. Phys. et Nat. de Lyon, viii. p. 401 (Woodlark Island).

Two specimens of a species of *Papilio*, belonging to the *P.-ulysses* group, agree fairly with Montrouzier's description cited above. They

have the six silky black spots on the anterior wings mentioned in the description, though the uppermost is almost obsolete. Until examples from Woodlark Island are compared with these specimens, it will not be possible to say if they really belong to *P. telemachus* or not.

38. PAPILIO POLYDORUS?

A male and a female of a species closely allied to *P. polydorus*, L., is in the collection. The species differs in its much shorter secondaries, and in the almost total disappearance in the male of the red submarginal spots of the upperside. It seems most nearly allied to the true *P. polydorus*, and is perhaps but a local form, which it is hardly necessary to characterize at present.

HESPERIDÆ.

39. TAGIADES, sp.?

A specimen of a species allied to *T. japetus* (Cr. Pap. Ex. t. 365. f. E, F), but differing in having a large white spot on the secondaries, which is surrounded by a dark border between it and the white fringe of the outer margin. As only a single specimen is sent, it is not advisable to name the species, if such it be, at present.

40. PAMPHILA AUGIAS.

Papilio augias, Linn.

A single worn specimen, apparently belonging to this widely ranging species.

HETEROCERA.

Mr. Brown's collection contains fourteen species of Moths, the genera of which and some of the species we have, with Mr. Butler's assistance and by comparison with the specimens in the British Museum, been able to determine. They are as follows:—

AGARISTIDÆ.

1. OPHTHALMIS LINCEA (Cr.) Pap. Ex. t. 228. f. B.

Agrees with specimens so named in the British Museum and with Cramer's figure. Cramer, however, states that his insect came from Surinam.

HYPSIDÆ.

This family is represented by three genera.

2, 3. HYPSA by two specimens (in bad condition) of two species, one of which appears to be allied to *Hypsa intacta*, Walk. (List Lepidopt. Brit. Mus. part ii. p. 451); the other approaches the species figured in the 'Voyage of the Astrolabe' as *Agnais australis* (Boisd. Voy. Astr. p. 252, t. 5. f. 3); but the hind wings, instead of being yellow edged with black, are uniform dingy brown; the white mark at the base of the primaries is also absent.

4. NEOCHÆRA EUGENIA (Cr.), Pap. Ex. t. 398. f. M (Amboyna).

A single specimen (in good condition) agrees very closely with Cramer's figure, and doubtless belongs to the species there represented.

5. CLEIS POSTICALIS, Guér. Voy. Coq. p. 286, t. 18. f. 5.

Originally described from specimens taken at Port Praslin, New Ireland, during the voyage of the 'Coquille.' The single specimen sent by Mr. Brown (the antennæ of which are gone) agrees accurately with the plate cited above.

NYCTIMERIDÆ.

6. NYCTIMERA, sp.?

A species allied to *N. lacticinia* (Cr. Pap. Ex. t. 128. f. E), which, however, is described as coming from the Coromandel coast.

LIPARIDÆ.

7. REDOA, sp.

A specimen in poor condition, but belonging to this genus.

OMMATOPHORIDÆ.

8. NYCTIPAO, sp. ?

A species allied to *N. crepuscularis* (Cr.) (Pap. Ex. t. 60. f. A), from Amboyna &c., but perhaps nearest *N. ephesphoris* (Hübn.). It differs from all the species represented in the British Museum in the position of the transverse band of the secondaries.

CYDIMONIDÆ.

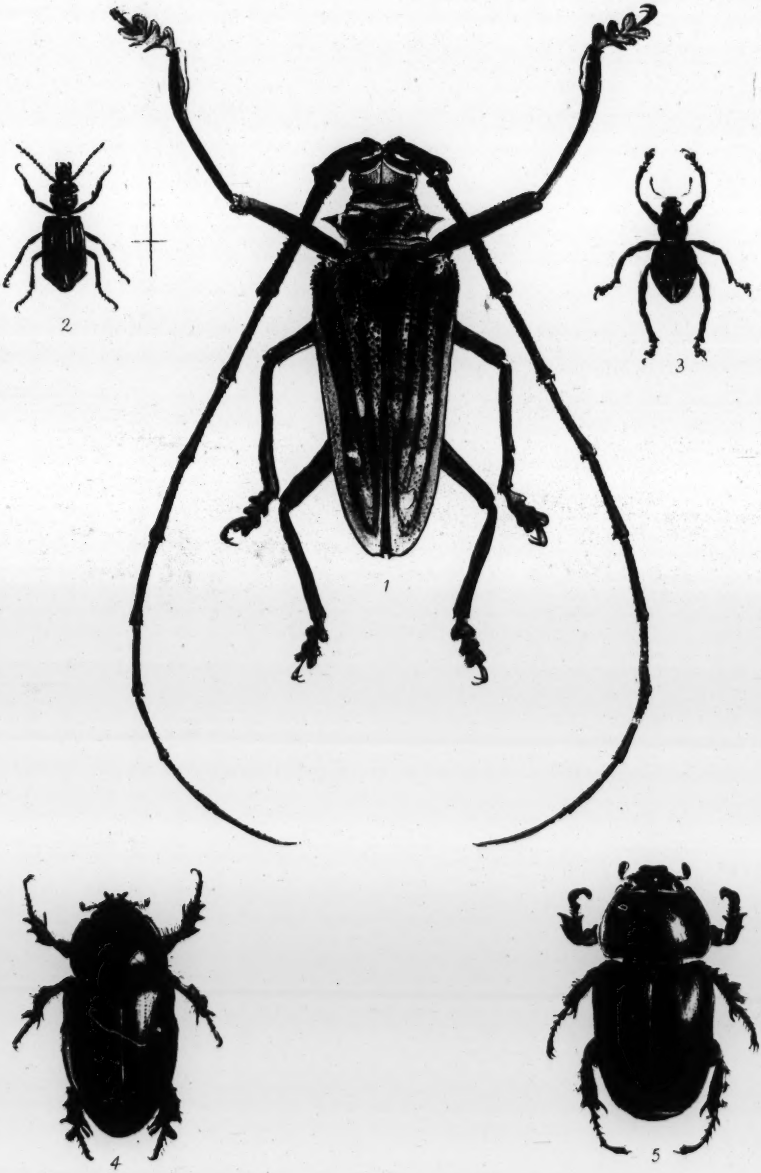
9. NYCTALÆMON PATROCLUS, L.

Papilio patroclus, Linn. Syst. Nat. i. p. 749, ex Clerk, Icon. t. 37. f. 1; Cr. Pap. Ex. t. 198. f. A.

The specimens sent by Mr. Brown (two males and one female) agree closely with the figures of Clerk and Cramer, and doubtless represent the true *P. patroclus* of Linnæus. This species is at once distinguishable from its allies by the direction of the transverse band of the primaries, which, instead of running nearly parallel to the margin, starts from a little beyond the middle of the costa and crosses to the inner margin just within the anal angle. Cramer's figure was taken from an Amboyna specimen.

10. ALCIDES AURORA, sp. n. (Plate XXIII. figs. 5, 6.)

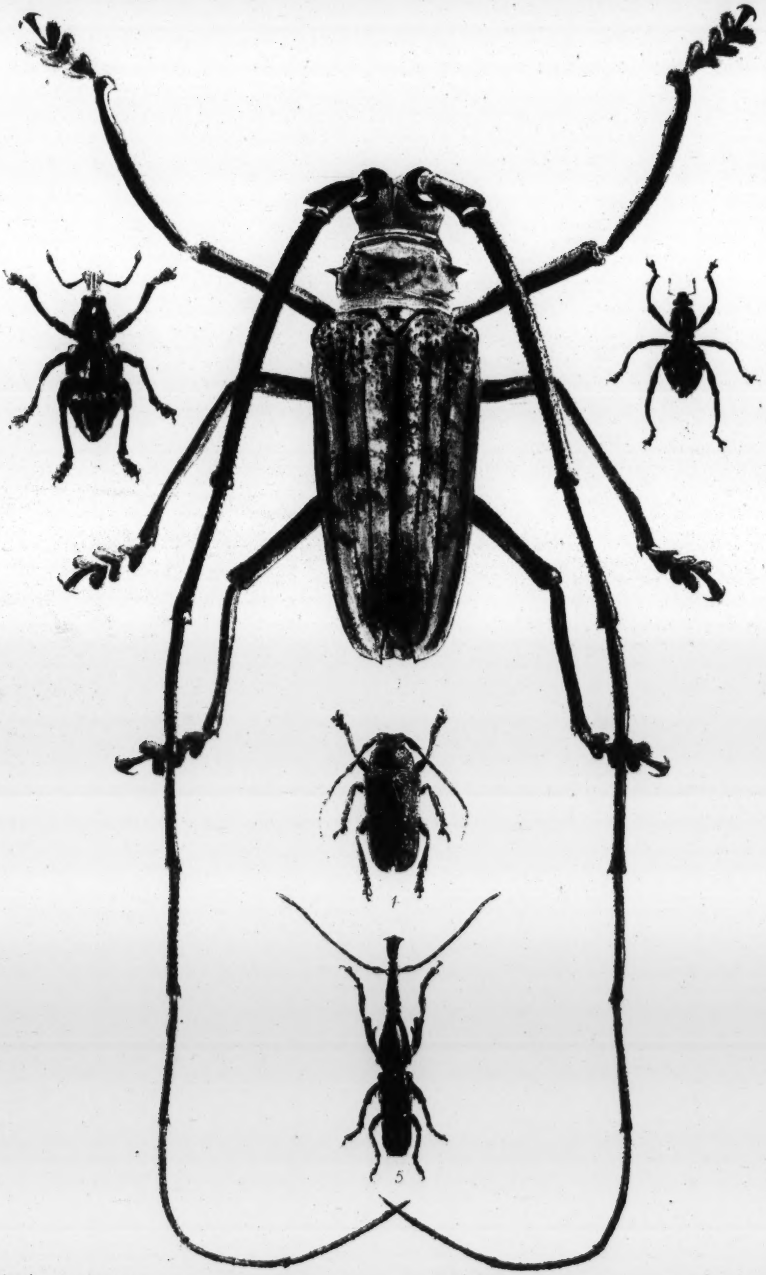
♂ Exp. 3·85. Primaries pointed; outer margin strongly curved, the anal angle falling well within the apical angle of the secondaries; secondaries rounded, without median projections, dentate on the outer edge, each tooth being rounded and furnished with a prominent fringe; primaries and basal half of secondaries deep greenish black; the cell metallic green blending with a green band which crosses the primaries beyond the cell to the inner margin just inside the anal angle; base of the costa variegated with the same colour; distal half



R.&H.F.Ripper del et lith.

M.& N. Hanhart imp.

NEW COLEOPTERA FROM DUKE OF YORK ISLAND.


1
5

of the secondaries white, washed with metallic green except the cilia, and with a pink patch spread over the middle of the median branches: beneath white, washed with pale metallic green, apical angle, a band crossing the primaries, and an irregular band following the curve of the outer margin of the secondaries greenish black; cilia white; antennæ black; body greenish black above; abdomen beneath orange.

Though abundantly distinct both in form and colour, the pink colour on the secondaries of this species suggests a resemblance to the insect described by Hopffer as *Nyctalæmon metaurus* (Neue oder weniger bek. Schmett. d. k. zool. Mus. z. Berlin, Heft ii. p. 2, t. 11. f. 3, 4), from the South Seas. We know of no other species with which it can be at all compared.

Palyidæ.

11. Eumelia rosalia (Cr.).

A single imperfect specimen apparently belonging to this widely ranging Moth.

Micronidæ.

12, 13, 14. Micronia.—Three species of this genus are in the collection, only one of which is represented in the British Museum, under the name of *M. justaria*, Walk. (Lep. Het. xxiii. p. 821 (Dorey).

EXPLANATION OF THE PLATES.

Plate XXII.

Figs. 1, 2. *Euplœa browni*, p. 142.
3, 4. *Doleschallia browni*, p. 145.

Plate XXIII.

Figs. 1, 2. *Diadema unicolor*, p. 144.
3, 4. *Pieris quadricolor*, p. 147.
5, 6. *Alcides aurora*, p. 150.

8. On the Coleoptera collected by the Rev. G. Brown, C.M.Z.S., on Duke-of-York Island, New Ireland, and New Britain. By H. W. Bates, F.L.S., F.Z.S.

[Received Feb. 20, 1877.]

(Plates XXIV. & XXV.)

The Coleoptera collected by the Rev. Mr. Brown comprise 44 species, all in single or very few specimens, except one large and beautiful Longicorn, a new *Batocera*, of which there is a great number of specimens, mostly in a much damaged condition. It is evident at a first glance of the contents of the jar, in which were a quantity of large Orthoptera (*Eurycantha horrida* and numerous Locustidæ), Spiders, and even a Bat, that the collection was hastily made, and can give no adequate idea of the extent of the

Coleopterous fauna. The first and doubtless a true impression is, that it is essentially the same as that of New Guinea, and not at all inferior as regards the size and beauty of the species. Although the collector evidently made no search, but simply took the first things that came in his way, the collection, small as it is, contains several species equal to the finest of the New-Guinea fauna.

Fam. CICINDELIDÆ.

CICINDELA D'URVILLEI, Dejean, Spec. Gén. des Coléop. v. p. 225.

Three specimens. It is recorded by Dejean as from New Guinea.

THERATES LABIATUS, Fabricius, Syst. El. i. 232; Dej. Spec. Gén. i. 158.

One specimen, of the bluer colour prevalent in New Guinea and the Aru Islands. The species is found throughout the Moluccas, and as far east as the Solomon Isles.

TRICONDYLA APTERA, Olivier, Entom. ii. 33. 7, tab. 1. f. 1; Dej. Spec. Gén. ii. 438.

One example, similar to others with which I have compared it from Mysol, Aru, New Guinea, and the Solomon Islands.

Fam. CARABIDÆ.

PSEUDOZÆNA ALTERNATA, n. sp. (Plate XXIV. fig. 2.)

Piceo-nigra, obscura, ventro elytrisque nitidis; capite postice ruguloso et modice punctato; thorace omnino subtiliter transversim ruguloso; elytris interstitiis alternis elevatis, costiformibus, politis.

Long. 8 lin.

Differs at once from all the other species (*P. orientalis, obscura,* and *opaca*) by its alternately raised and polished elytral interstices. The crown and nucha, as well as the thorax, are much more finely sculptured than in *P. obscura* from Borneo and Singapore. The intervals of the elytra between the raised lines are little less shining than the latter; and the punctured striæ are but slightly impressed and somewhat irregular.

Fam. CUCUJIDÆ.

HECTARTHRUM BISTRIATUM, Castelnau, Hist. Nat. des Ins. ii. p. 384.

One example, differing from the description above cited only in being of twice the dimensions. Castelnau's species is from Java.

Fam. LAMELLICORNIA.

PARASTASIA BIMACULATA, Montrouzier, Ann. Soc. Agr. Lyon, 2me série, vii. p. 23 (1855).

P. percheroni, id. Ann. Soc. Ent. Fr. 1860, p. 271.

This species, described by Montrouzier from Woodlark Island, not

far from New Ireland, and from Lifu, is said by Reiche to be identical with *P. bimaculata* (Guérin) from Penang. If I have rightly determined the species, it is distinct, being much less coarsely punctured, especially on the thorax.

ORYCTODERUS CORONATUS, n. sp. (Plate XXIV. fig. 5.)

Oblongus, modice convexus, niger nitidus, capite subcrebre punctulato, thorace sparsissime punctato, transversim quadrato, angulis posticis late rotundatis; elytris thorace haud latioribus, stria suturali excepta omnino lævibus; sternis castaneo-rufis, rufo-hirtis.

♂. *Clypeo utrinque fortiter bisinuato (haud inciso), margine antico recto, paulo reflexo; fronte media unituberculata; tarsis anticis ut in* O. latitarsi *incrassatis.*

Long. 18 lin.

Closely allied to *Oryctoderus latitarsis*, and differing solely in the form of the margins of the clypeus, and the presence of a tubercle in the middle of the forehead. A species (still undescribed) was taken by Wallace in the island of Goram, which presents also the character of a tuberculated forehead; and I should have been inclined to regard both as varieties of *O. latitarsis*, if this latter species did not show itself so constant in its specific characters. The Goram species, besides being much smaller, differs in the nearly entire lateral margins of the clypeus.

There is only one example in the collection, unless a female individual, 11 lines long, be a small specimen of the other sex.

DIPELICUS NASUTUS, n. sp. (Plate XXIV. fig. 4.)

Oblongus, convexus, crassus, supra castaneo-niger nitidus, subtus castaneo-rufus, rufo-hirtus; capite lævi, clypeo antice obtuse bidentato laminaque ascendente semiovata, apice late emarginata; thorace sparsim subtiliter punctulato, haud excavato, sed sulco dorsali antice lævi haud profundo; elytris striato-punctatis striaque suturali magis impressa.

Long. ♂ 18 lin.

Allied to *D. cantori*, but distinguished at once by the vertical expansion of the clypeus being notched at the tip instead of entire and triangular. The singular dilatation of the terminal joint of the labial palpi, distinctive of this genus, is well developed, as is also the truncation of the dilated apices of the posterior tibiæ and the long dilatation of the upper edge of the basal joint of the hind tarsi.

One example only.

SCAPANES AUSTRALIS, Boisd., 'Voyage de l'Astrolabe,' Coleop. p. 158, tab. 9. f. 4.

One pair; more robust and with more coarsely punctured elytra than New-Guinea specimens taken by Wallace. The thoracic horns are parallel, instead of convergent towards the tips. If these differences prove constant when a large number of specimens are obtained, they may prove the present form to be a distinct species.

XYLOTRUPES GIDEON, Linn. Syst. Nat. i. 2, p. 541.

Half a dozen specimens, of both sexes; the males in different stages of development as regards the cephalic and thoracic horns; compared with individuals from Flores, Penang, &c., I perceive no difference worthy of mention, although Philippine and Australian specimens differ very considerably. The typical *X. gideon* inhabits Java.

PHÆOCHROUS.

A species not at present determinable, the single specimen agreeing with others I have received from Marquis Doria as found by Dr. Beccari at the Aru Islands.

Fam. LUCANIDÆ.

CLADOGNATHUS BISON, Olivier, Entom. i. 1, p. 13, tab. 3. f. 6.

Two specimens. The species is found in Amboyna and Celebes, and, if *Cl. cinctus* of Montrouzier is but a slight var., as Major Parry believes, also in New Guinea, Kei Is., Aru and Woodlark Island.

EURYTRACHELUS THOMSONI?, Parry, Trans. Entom. Soc. vol. ii. 3rd ser. p. 47.

One male example of a species of this genus, agreeing with the description above quoted in the polished disk of the elytra. It differs, however, in various other points, so as to leave the determination uncertain.

PASSALUS.

There is in the collection a species, of this or an allied genus, which cannot at present be determined.

Fam. BUPRESTIDÆ.

CYPHOGASTRA.

A species of this genus, which I am informed is about to be described by Dr. Gestro, from New-Guinea examples.

Fam. CLERIDÆ.

CYLIDRUS VESCOI, Fairmaire, Rev. et Mag. Zool. 1849, p. 361.

One example, known previously only from Tahiti.

Fam. CURCULIONIDÆ.

PACHYRHYNCHUS BIPLAGIATUS. (Plate XXIV. fig. 3.)

Pachyrhynchus biplagiatus, Guérin, Rev. Zool. 1841, p. 216.

One example. Found also in the Solomon Islands.

PACHYRHYNCHUS VERRUCATUS, n. sp. (Plate XXV. fig. 3.)

Æneo-niger, politus, pedibus sparsim griseo-hirtis; thorace oblongo-ovato, lateribus sparsim, linea dorsali impressa dense argenteo-squamosis; elytris globoso-ovatis, thorace duplo la-

tioribus, grosse striato-punctatis, basi lateribus et apice viridi-argenteo maculatim squamosis, dorso utrinque maculis duabus rotundatis elevatis corallinis politis.

Long. 7 lin.

Closely allied to *P. quadripustulatus* (Gestro, Ann. Mus. Civ. di Genova, vii. p. 1008) from Geelvink Bay, New Guinea; agreeing with that species in the peculiar raised coral-like spots of the elytra. According to a coloured drawing which Dr. Gestro has kindly sent me, the two spots of each elytron in his species are much more widely distant than they are in *P. verrucatus*, the thorax is destitute of the dorsal line of scales, and the rounded patches of greenish-silvery scales which adorn the base, sides, and apex of our species are wanting. In his species the thorax is much broader in proportion to the elytra, and the elytra longer and less globose; but these may be distinctive of the sex of his specimen, doubtless a female. In *P. verrucatus* the lines of large punctures are interrupted and diverted near the site of the raised red spots. The rounded patches of scales consist of one on each side of the scutellum, a marginal row of five or six on each side, a submarginal row of three or four, and a vitta-formed one parallel to the suture near the apex. The meso- and metasternum are also adorned with patches of similarly-coloured scales.

One example.

Eupholus browni, n. sp. (Plate XXV. fig. 2.)

Niger, rostro verticeque viridi-aureo squamosis; thorace dorso late sulcato, vittis quinque argenteo-viridi squamosis, una dorsali interrupta, alteris utrinque duabus lateralibus; elytris basi planatis, postice gibbosis, grossissime punctato-sulcatis, fasciis et maculis argenteo-viridi squamosis, scilicet (1) *juxta humeros maculis nonnullis parvis,* (2) *ante medium fascia maculari interrupta prope suturam valde antice curvata,* (3) *fascia pone medium maculari recta, et* (4) *vittis subapicalibus tribus prope suturam et marginem; pectore et abdomine lateribus læte aureo-viridi-squamoso maculatis.*

Long. 12 lin.

Allied to *Eu. amaliæ* (Gestro, Ann. Mus. Civ. di Genova, vol. vii. p. 1004), from which it differs, according to a coloured drawing with which Dr. Gestro has favoured me, in the form and situation of the belts and vittæ of silvery blue or green scales of the elytra. It is one of the most beautiful species of the genus. *Eu. amaliæ* was found at Sorong in N.W. New Guinea.

One example.

Eupholus, sp.

Three specimens of an apparently variable species which cannot at present be determined.

Sphenophorus, sp.

One example. There are also four other Curculionidæ in the collection, obscure forms which cannot at present be named.

Fam. BRENTHIDÆ.

ECTOCEMUS RUFICAUDA, n. sp. (Plate XXV. fig. 5.)

♂. *Niger, nitidus, subtus (prosterni lateribus exceptis), antennis et pedibus castaneo-rufis, elytris maculis vittæformibus utrinque quinque apiceque late castaneo-fulvis; rostro opaco, supra sulcato, parte basali cylindrica asperiter granulosa, parte anteriore medio fortiter constricta, apice triangulari, marginibus reflexis serratis; antennis omnino strigosis.*

Long. 17 lin.

This species so nearly resembles *E. pterygorhinus* (Gestro) of Cape York, Australia, that I have some hesitation in describing it as distinct. The differentiating characters, however, seem to be of the same kind and degree as those which suffice to distinguish most other species of the group. The most conspicuous points of difference reside in the elytral markings, the linear pale spots in the present species consisting of (1) on the second interstice a longer line at the base and a shorter one towards the apex, (2) on the third interstice a line of moderate length exactly in the middle, (3) on the fifth a very short line considerably behind the middle, and (4) on the seventh a short line not far behind the shoulder. Besides these pale marks, the whole of the apex of the elytra is reddish, a feature which I do not observe in the characters of any other described species.

ORYCHODES, sp.

CEOCEPHALUS, sp.

BRENTHUS, sp.

Fam. LONGICORNIA.

XIXUTHRUS MICROCERUS.

Macrotoma microcera, White, Cat. Long. Col. Brit. Mus. i. p. 40.

Three examples. The species is generally distributed throughout the Moluccas. Mr. Wallace met with it at Kei, Morty, Mysol, Bouru, Amboyna, Batchian, Celebes, Ternate and New Guinea (*Dorey*). It has also been recorded from Java.

ARCHETYPUS FULVIPENNIS, Pascoe, Trans. Ent. Soc. v. ser. 2 p. 15; *id. ib.* iii. ser. 3, p. 672.

One example, ♂. Found also by Mr. Wallace in Aru Island, Bouru, Waigiou, Dorey, and New Guinea.

NEOCERAMBYX AURIFABER.

Hammaticherus aurifaber, White, Cat. Long. Col. Brit. Mus. i p. 128.

Several specimens. A widely distributed species in the Eastern archipelago.

CERESIUM SIMPLEX, Gyll. in Schönh. Syn. Ins. App. i. 3, p. 178.

Two specimens. A very widely distributed species throughout

the eastern intertropical islands, from the Philippines to Tahiti, but, according to Mr. Pascoe, not met with by Mr. Wallace.

SPHINGNOTUS DUNNINGI, Pascoe, Trans. Ent. Soc. 3rd ser. iii. p. 484, pl. xviii. f. 4.

A single example, male, which, on account of the identity of its peculiar coloration and general structure, may be referred to this species, of which only one specimen is known. Our insect differs from Pascoe's figure (representing probably the female) in its broader head, rather longer thorax and more parallel-sided elytra, characters which are generally found to be distinctive of the male sex in the Longicornia.

PELARGODERUS AROUENSIS.

Rhamses arouensis, Thomson, Arch. Ent. i. 446, pl. xvii. f. 8.

Several specimens of large size, not differing from the Aru-Island form.

DIOCHARES FIMBRIATUS.

Cerambyx fimbriatus, Oliv. Ent. iv. p. 71, pl. xix. f. 143.

One specimen of the entirely opaque variety of this variable species.

MONOHAMMUS LONGICORNIS, Thomson, Arch. Ent. i. p. 444.

The species was previously recorded only from Aru and Saylee.

BATOCERA BROWNI, n. sp. (Plate XXV. fig. 1.)

B. wallacei (Thoms.) *affinis. Magna, robusta, supra pube cinerea vestita; thorace immaculato; elytris tuberculis nitidis sparsissimis a basi usque ultra medium notatis, utrinque lineis duabus paulo elevatis, interstitiis densius tomentosis, apice breviter sinuato-truncatis, angulo suturali dentiformi.*

♂. *Antennis longissimis, validis, tuberculato-asperatis; art. tertio valde elongato et robusto, pedibusque anticis denticulato-asperatis.*

Long. 36 lin.

Distinguished from all the varieties of *B. wallacei* that I have seen, by the whole body, above and beneath, being clothed with ashy white pubescence, three macular streaks down each elytron being formed of more dense felted tomentum of an ochraceous tint, and the flanks of the body having the usual chalky-white vitta; also by the very different tuberculation of the elytra, which consists in a number of small, widely scattered, black tubercles, spread over the whole surface except towards the apex, where the derm is coarsely reticulate-rugose, and where the dense tomentum conceals the integument. Besides these scattered tubercles, each elytron has two fine raised shining lines, apparently formed of tubercles arranged linearly. The outer angle of the apical truncature of the elytra is rounded, and not

dentate as in *B. Wallacei*. As to the general form of body, legs, and antennæ there is no conspicuous difference.

The species is allied also to *B. una* of White (New Hebrides), described from a ♀ example; but in this latter the clothing of the elytra is quite unicolorous. One example.

BATOCERA NEBULOSA, n. sp. (Plate XXIV. fig. 1.)

B. gerstaeckeri (Thoms.) *affinissima; differt elytris fere æqualiter cinereo irrorato-nebulosis anguloque exteriore truncaturæ apicalis nullo modo spinoso. Elongata, fusca, elytris subæneo-fuscis nitidis, tomento cinereo passim subplagiatim irroratis, basi dense tuberculatis; thorace immaculato; corpore subtus lateraliter albo vittato.*

♂. *Antennis corpore duplo longioribus, rugosissimis: articulis* 3–6. *subtus denticulato-asperatis, apice haud spinosis: tarsorum anticorum articulis* 1. *et* 2. *extus spiniformiter productis.*

A species so closely resembling *B. gerstaeckeri* from Sula, that I should not have ventured to treat it as distinct, had not the many dozens of specimens compared showed a perfect constancy in the few points of difference. Most of the specimens are more or less abraded; but in the many which have the pubescence intact, it is much more equally distributed over the elytra than in *B. gerstaeckeri*, and the subregular bare shining patches of the ground-colour of that species do not exist. In the abraded specimens the derm does not possess the glossiness which distinguishes *B. gerstaeckeri*. A constant structural peculiarity is the untoothed outer angle of the elytral truncature. The spinous prolongation of the anterior tarsi of the ♂ is always seen on the first joint, but on the second only in large well-developed individuals.

PERIAPTODES LUCTATOR, Pascoe, Trans. Ent. Soc. iii. ser. 3, p. 284.

Several examples. The species was originally taken by Wallace in Ceram.

GNOMA GIRAFFA.

Cerambyx giraffa, Schreibers, Linn. Trans. 1801, vi. p. 198, pl. xxi. f. 8.

Two examples, ♂. Much more robust in form than the same species from Ceram and Amboyna; but the elytra are granulated and punctured in the same way, and not smooth posteriorly as in the closely allied New-Guinea species *Gn. ctenostomoïdes*.

ECZEMOTES GUTTULATA, n. sp. (Plate XXV. fig. 4.)

Oblonga, convexa, atro-fusca, tenuiter brunneo-pubescens, supra omnino subconfertim nitido-granulata; elytris guttulis ochraceis sparsim conspersis, apice brevissime truncatis; subtus nigro-nitida, capite et sternis lateribus, tibiis autem extus fulvo-

tomentosis, femoribus antennarumque scapo subtiliter granulatis.

Long. 11 lin.

One example.

Fam. CASSIDIDÆ.

ASPIDOMORPHA, sp.

One specimen.

Fam. COCCINELLIDÆ.

EPILACHNA, sp.

Two specimens.

EXPLANATION OF THE PLATES.

PLATE XXIV.

Fig. 1. *Batocera nebulosa*, p. 158.
2. *Pseudozæna alternata*, p. 152.
3. *Pachyrhynchus biplagiatus*, p. 154.
4. *Dipelicus nasutus*, p. 153.
5. *Oryctoderus coronatus*, p. 153.

PLATE XXV.

Fig. 1. *Batocera browni*, p. 157.
2. *Eupholus browni*, p. 155.
3. *Pachyrhynchus verrucatus*, p. 154.
4. *Eczemotes guttulata*, p. 158.
5. *Ectocemus ruficauda*, p. 156.

March 6, 1877.

Dr. E. Hamilton, V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of February, 1877.

The total number of registered additions to the Society's Menagerie during the month of February was 57, of which 30 were acquired by presentation, 18 by purchase, 2 were bred in the Gardens, and 7 were received on deposit. The total number of departures during the same period, by death and removals was 66.

The most noticeable additions during the month of February were as follows:—

1. A Mexican Eared Owl (*Asio mexicanus*[1]), purchased of a

[1] In his new Catalogue of Owls (Cat. Birds, ii. p. 231) Mr. Sharpe has transferred the term *americanus*, which Mr. Salvin and I, following Burmeister, have used for the present species, to the American form of *Asio otus*, usually called *wilsonianus*, and has, moreover, given "Stephens" as the authority for the name. But the name *americanus* was made by Gmelin (1766), not by Stephens, and was founded on Brisson's *Asio americanus*, which, so far as I can decide, is much more likely to have been intended for the present bird than for *A. wilsonianus*. Whether "*Strix mexicana*, Gm.," founded ultimately on the

dealer in Liverpool, Feb. 14th, and said to have been received from Para, being the first example of this very well-marked spieces of *Asio* (sive *Otus*) which I have seen alive.

2. A Rhea, purchased at Liverpool, Feb. 14th, along with the above-mentioned Owl and other animals. This bird appears to belong to the species which, in 1860, I distinguished as *Rhea macrorhyncha* (Trans. Zool. Soc. iv. p. 356, pl. xlix.), from an example then living in the Society's Gardens, which had been originally obtained at the same port.

There can be no question, I think, that we have here to deal with a locally isolated race of *Rhea americana*, probably existing somewhere in the campos of the interior of N.E. Brazil, whence individuals are generally brought down to Para.

The present specimen is in very poor condition, but, so far as a cursory examination of it in its present state can decide, presents all the characters assigned to *R. macrorhyncha* in my description and figure.

[P.S.—Since I read this report, Mr. Salvin has called my attention to the following passage in Stedman's 'Narrative of an Expedition to Surinam' (London, 1806), which seems to indicate the existence of a *Rhea* in that country:—

"The largest bird in Guiana is there called *tuyew*, and by others *emu*. It is a middle species between the Ostrich and the Cassowary (as I was told; for I never saw one in the country). It is said to be about six feet high from the top of the head to the ground: its head is small, its bill flat, the neck and limbs long, the body round, without a tail, and of a whitish-grey colour; its thighs are remarkably thick and strong; and it has three toes on each foot, while the Ostrich has but two. This bird, it is said, cannot fly at all, but runs very swiftly, and, like the Ostrich, assists its motion with its wings. It is mostly found near the upper parts of the rivers Marawina and Seramica."]

Mr. E. W. H. Holdsworth, F.Z.S., exhibited a specimen of *Geocichla layardi*, Walden, which had been obtained in 1876, at Jaffna, in the north of Ceylon. It differed from the type specimen described by Lord Walden in 1870, the only previous example recorded, in having the orange parts less bright, and the back and wing strongly tinged with olive. As the latter character is distinctive of the female in some other species of this group of Thrushes, there was every reason to believe that both sexes were represented in the only two examples known of this peculiar Ceylonese species.

The following papers were read:—

"Tecolotl" of Fernandez, can be fairly construed as applicable to this Owl, is very doubtful indeed; but as to continue to use the term *americanus* would lead to great ambiguity, it is better, perhaps, to adopt Gmelin's name *mexicanus* for the present species.—P. L. S.

1. Notes on *Ornithorhynchus paradoxus*. By George Frederic Bennett, in a Letter from Dr. George Bennett, F.L.S., F.Z.S., to Professor Owen, C.B., F.R.S., &c., with Remarks by the latter.

[Received February 12, 1877.]

At the conclusion of a paper "On the Ova of the *Ornithorhynchus paradoxus*," in the 'Philosophical Transactions' for 1834, I noted "the principal points in the generative economy of this animal which remained for determination" (p. 565). These points were again urged on the attention of observant naturalists in Australia, in the paper "On the Marsupial Pouches, Mammary Glands, and Fœtus of the *Echidna hystrix*," in the 'Philosophical Transactions' for 1865, p. 682.

The letter of December 21st, 1876, with which I have been favoured by my esteemed friend Dr. George Bennett, and which I have now the pleasure to communicate to the Society, affords good ground to hope that, through the continuance of the researches of his son (results of which are appended to the letter), some at least of these points will shortly be determined.

"Sydney, Dec. 21, 1876.

"My dear Owen,—I have received from my son, Mr. G. F. Bennett, at Toowoomba, Queensland, the following notes he has made on the *Ornithorhynchus*. They give the results of his first attempt at exploring the burrows of these singular animals for the purpose of ascertaining their season of copulation and other important points, such as the manner of copulation, the period of gestation, the nature and succession of the temporary structures developed for the support of the fœtus during gestation, the exact size, condition, and powers of the young at the time of their birth, the act of suckling, the period during which the young requires the lacteal nourishment, and the age at which the animal attains its full size. These queries were made by you some years ago; and I have always responded that no reply could be given to them except by exploring the animals' burrows, by aid of the aborigines, at different seasons of the year. This has now been commenced, and, if steadily followed up, will no doubt result in some interesting discoveries as to the generation of the Monotremata.

"I remain, my dear Owen,

"Your sincere old friend,

"George Bennett, M.D."

The notes are as follows:—

"'Having heard that the *Platypus* was found very plentiful in the Lockyer Creek, which is an eastern water emptying itself into the Bremer river, I started on the 26th of October, 1876, with Mr. A. T. Blakiston, to a selection of his on the Lockyer, near Helidon, to

commence my investigations. After arriving at our destination we went to the creek, and found a very fine water-hole, where, during the winter, *Platypi* are said to be very numerous; so, after going in the water, we discovered many holes in the banks, which we surmised were very probably burrows of the Water-Mole. On the 27th I went down, accompanied by Mr. Blakiston, to the water-hole we had visited on the previous evening, which was bordered by rocks on one side, but on the other by a high sandy bank. I then found a burrow, which I thought would repay the trouble of excavating; so I set steadily to work and gradually opened it up. The burrow was about four by three inches in size, running all the way upwards in a serpentine direction; and when I had got about five feet from the entrance, I came to a chamber on the right-hand side, twelve inches in length by six inches high, and eight inches in diameter. I thought at the time that I had arrived at the end of the burrow; but on probing further on my left, I found that it still ran on; so I continued to dig until I had got about five feet further, when I found another chamber similar in size to the first, my burrow still continuing to the left. I then proceeded with my digging, and did not reach the end until I had gone another ten feet, when to my surprise and delight I found a chamber measuring 18 inches by 10 inches, and 8 inches in diameter, which contained a nest formed of dried grass, reeds, and gum-leaves (*Eucalypti*), evidently, from their blackened appearance, taken from under the water. In the nest were two young *Platypi*, probably about a month old. In the nest they were rolled up in a ball, with the tail lying flat on the beak, or rolled up with the tail covering the head, and the beak resting on the stomach or on the back, and with the right paw resting on the tail coiled up. They were very fat and plump, but without fur, of a greyish colour, and had a velvety appearance when the sun was shining upon them. The young ones measured five inches from the head to the tail. Their eyes were not opened fully, which satisfied me that they had never been out of the nest. I was very much disappointed at not finding the mother with them, as, when putting my hand up the burrow after I had dug fifteen feet, I fancied I heard a kind of growl like that of a Koala; but I must have been mistaken, as I searched the place well on the following day to ascertain if there was any sign of an opening where she could have escaped.

"'On the 28th I brought the young ones home with me and left them on their nest in my room, when I observed that their favourite resting-position was lying on their backs, the beak resting on one of the fore feet, and the other stretched out. When handled they gave a shrill kind of hiss or whistle, resembling that of a young duck. I attempted to get them to suck, but without success. I used a feeding-bottle with a glove nipple made very small to suit the aperture of their throat. They were therefore three days without any food, but looked as well and as lively as on the day I took them from the nest; but they soon perished, and I have preserved them in spirits to send to Sydney.

"'The sketch (fig. 1, p. 163) will give a very good idea of this burrow

when excavated, showing also that the object of the animal is always to reach as high above flood-level as possible. It is not actually above the winter floods, which in this creek are very heavy, but above the mark of ordinary freshets. The chambers on the right are raised about an inch above the floor-level of the burrow, and, although they bear indications of having been occupied, do not appear ever to have been used as a nest, as no sign of grass of any description was found in them.

Fig. 1.



Sketch of burrow of *Ornithorhynchus*, laid open October 26th.

"'I visited the same place at Helidon, accompanied by Mr. Blakiston, on the 19th of November, 1876, and again inspected the burrow in which I had previously found the young *Platypi*, to see if the mother had escaped by means of any side entrance, but found none. I then looked for another burrow, and found one which I considered would repay the trouble of excavating; so I set to work, and after proceeding about 4 feet came upon a small chamber on the left side, which ran out to 4 inches in diameter, the widest side nearest the burrow being 9 inches in width and 6 inches high; and then following

the burrow for another 4 feet, I came to another chamber on the right-hand side, which was 9 inches wide, 15 long, and 5 inches high; the burrow still continued for 2 feet more, when the final chamber was reached. This had an entrance about 10 inches wide; the chamber measured 17 inches long, 10 inches wide, and 6 inches high; but there was no sign of any nest in it, nor any thing to indicate that it had been inhabited for that purpose at any time, although the surface of the top appeared to be smooth and hard, as if the animal

Fig. 2.



Sketch of burrow of *Ornithorhynchus*, laid open November 19th.

had been rubbing upon it. I then found and opened another burrow, which showed indications of being inhabited. The size of the entrance was $2\frac{1}{2}$ to 4 inches, and ran very circuitously. I then excavated this burrow to about 20 feet (having passed a small unfinished chamber on the left about 4 feet from the entrance, which is shown in the sketch, fig. 2; at every foot the burrow was rising up the bank), when I came upon a chamber on the right-hand side measuring 8 inches high, 10 inches wide, and 16 inches long. I then dug on for about 2 feet more, when I came upon another chamber on the right-

hand side measuring at the entrance 10 inches wide, 8 high, and 10 long. I then continued to dig about 6 feet more, when I came upon another chamber with an opening of 10 inches. In this chamber, which measured 18 inches long, 8 inches high, and 12 wide, I found, to my delight, two young ones, their skins of a bluish tint with a glossy appearance, as if a down were coming over them, and measuring 4½ inches from the beak to the tip of the tail. They had not got their eyes opened; but I resolved to try if they could swim at all; so I obtained a tin dish which would hold about a depth of water of 8 inches, and I put one in at a time. They swam on vigorously, but could not keep their heads above the water, although they made great efforts to do so. After they had been about 25 seconds in the water, I took them out and returned them to their nests, perfectly satisfied that up to this time they had never been in the water. The young *Platypi* were taken from the nest about noon on the 19th of November, and had no food given to them until Monday night, about 9 P.M., when they had a little milk sweetened with sugar, and lukewarm. They took about a teaspoonful each. The plan adopted to feed them was to insert one teaspoon into the mouth and gradually pour the milk from another into it. They were fed regularly three times daily, and appeared healthy and lively to the time of their death, which happened about midday on Wednesday the 22nd of November, within an hour of each other. Every care was taken to keep them warm: they were placed in a box in their natural nest with an addition of wool; the light was excluded, leaving a sufficient circulation of air. The day before their death, when the beak was placed in the spoon containing the milk, they appeared to lap it up. They did not waste away, but were quite plump when they died. They were very restless at night, keeping moving about the box; in the day-time they were nearly always asleep. After death they decomposed so rapidly that I was not able to put them in spirits.

"'One peculiarity in the burrows laid open was that the side-chambers, with only one exception, were situated on the right-hand side, and slightly higher than the main track of the burrow. The use of these chambers I cannot comprehend; for even when I have found nests, these chambers show no signs of having been used, even at any remote period, as they have nothing left in them, not even a bit of grass. I believe that the reason why I have as yet been unable to capture any of the old animals, in the nest or in the burrows, has been that I have commenced operations too early in the morning, before they have returned from their excursions in search of food; but on this and other subjects connected with the economy of these singular animals I hope next season to effect some more interesting discoveries, as this time I was ignorant and did not know how to commence exactly and had to work without any of the blacks. In the burrow shown in the second sketch (fig. 2), the nest was much deeper under the ground than in the first (fig. 1), being fully 4 feet from the surface of the ground (the other being 2 feet) and through a very hard sandy soil. Having taken the level of the hole from the water-surface, found that it was 22 feet; so that it would be a good flood that

would reach that height: and such floods are not common, as the opposite side of the creek is flat.

"'The *Echidna*, or Native Porcupine, is very numerous in the Gomarren Scrub, Merugaden, lately a portion of Gowrie run, but now the homes of many free selectors. A friend, Mr. Wilcox, caught four for me, but injudiciously placed them in his garden, from which they soon escaped by burrowing. I regretted this, as it was the supposed season of the year for their breeding. They are often found about the nests of the Brush-Turkeys (*Talegalla*). A lad one day brought me a young one which I considered was about two months old.'"

These notes, besides the interest of the direct observations on the burrows and nests of the *Ornithorhynchus*, and the success of the experiment of feeding the young with lukewarm slightly sweetened milk, for three days, which in some degree supports the conclusions on the function of the abdominal glands of the Monotremes[1], affords a valuable indication of the probable period at which the female *Ornithorhynchus* may be got in the impregnated state. The specimen with uterine ova, described in 'Phil. Trans.' 1834, p. 555, was shot by Dr. Bennett, on the 7th October; the first pair of young were discovered by his son on the 28th October; the second pair, discovered on the 19th November, were somewhat smaller. The young *Ornithorhynchi* taken in 1832 by Dr. Bennett, from a nest on the banks of the Murrumbidgee river, which young measured only $1\frac{1}{8}$ inch in length (in a straight line), and were considered by him to have been recently brought forth[2], were discovered on the 8th December.

From this it may be inferred that the breeding-season of the *Ornithorhynchus* has a certain range in time. They may bring forth in one river a few weeks earlier or later than in another; and there seems to be a difference of a week or two, in this respect, in the same river. But the months of September, October, and November are those in which there seems to be most chance of obtaining a pregnant *Platypus*.

Of the breeding-season of the *Echidna* I have not yet received as satisfactory indications. It would seem to be earlier in the year, as the young in the rudimental pouch, described and figured in the paper above cited[3], was stated to have been found, with the mother (which was captured), on the 12th August. The month of July might be the time favourable for obtaining a female *Echidna* in the impregnated state. As the *Echidna* is very numerous in a locality which may be within the range of observation of the author of the preceding 'Notes,' I feel sanguine that the means of determining the uterine and fœtal membranes and appendages of the Monotremes will be afforded to the anatomist at no great distance of time.

[1] 'Phil. Trans.' 1832, p. 517, and 'Phil. Trans.' 1865, p. 671.
[2] 'Phil. Trans.' 1834, p. 566.
[3] Phil. Trans. 1865, p. 678.

2. Descriptions of three new Snakes of the Family Uropeltidæ from Southern India. By Lieut.-Col. R. H. Beddome, F.Z.S.

[Received February 12, 1877.]

PLATYPLECTRURUS MADURENSIS, n. sp.

Snout much rounded and very obtuse; rostral very small, scarcely reaching the surface of the head; nasals very large, vertical, six-sided, not much produced behind; 3rd labial large, but 4th much larger; eye pretty large, surrounded by the 3rd labial, postfrontal, superorbital, and postocular (the latter shield sometimes confluent with the supraorbital); occipitals elongate; mental very small; the 1st pair of chin-shields meet behind it and have a 2nd pair between them and the 1st ventral; an elongated temporal shield is sometimes present between the 4th labial and the occipital; abdominals 149–170; anal bifid; subcaudals 10–15; tail scarcely compressed, scales quite smooth; terminal scale sharp-pointed, and with a sharp ridge on each side; colour above a nacreous purplish-brown; each of the abdominal scutes and the two lower rows of scales on each side, white in the centre, but with a complete ring round the outer margins of the same colour as the back, giving the whole belly a very uniform coloration. 11–14 inches long.

Hab. About Kodiukarnal on the Pulney Mountains (Madura district), 600 feet elevation; very rare.

SILYBURA DINDIGALENSIS, n. sp.

Rostral large, as long as the vertical, acute and with a high ridge, not separating the nasals, which are very large; eye very small, in front of the ocular shield; vertical much pointed behind; scales in 19 rows on the neck and anterior portion of the body, and 17 round the middle, the central row not at all enlarged; caudal disk well defined and flattened, but not nearly so much as in *S. ceylanica*, some of the scales small, with 4 prominent keels, others confluent into elongated scales the whole breadth of the disk, and furnished with 10–17 keels; terminal scale large, slightly bicuspid; abdominals large, 167–169, and bifid; subcaudals 6 pairs. Colour yellow, much blotched with black, each scale being a bright yellow (during life) more or less blotched and spotted with black, the two colours nearly equal, or the yellow rather predominating; belly blackish, with very irregular transverse bars of yellow; a yellow line runs along the labials and a short way along the sides of the trunk; tail yellow beneath. 12–15 inches long by $1\frac{3}{4}$ inch in circumference.

Hab. Heavy forests on the Sirumullay hills, near Dindigul, at 4000–5000 feet elevation.

SILYBURA MACRORHYNCHA, n. sp.

Rostral exceedingly large, nearly $\frac{1}{4}$ inch in length, very acute, and raised in a sharp ridge along its upper surface; nasals large, very

oblique, broad below, very narrow upwards, and just meeting behind the rostral, vertical 3-sided shield-shaped; eyes very small, near the front of the ocular shield; scales in 19 rows round the anterior portion, in 17 round the middle of the body; abdominals 226; anal bifid; subcaudals 6 pairs, length 21½ inches, girth very nearly 2 inches. Colour uniform brown, but somewhat paler below; a marginal yellow band along the side of the trunk for a short distance, commenciug at the 4th labial; tail black below, but encircled by a yellow band. Caudal disk rather flat; the scales with 4–5 prominent keels; terminal one very large, bluntly bicuspid.

Hab. Anamullay Mountains, 4000 feet elevation; very rare.

3. Descriptions of new Species of Heterocerous Lepidoptera in the Collection of the British Museum. By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Received February 16, 1877.]

The followiug interesting new species are all based on comparatively recent additions to the national collection.

Sphingidæ.

Diludia chromapteris, n. sp.

Primaries silvery grey, crossed by subangulated lunulated brown lines, very indistinct at the base, most strongly marked upon the costal area; the usual apical patch bordered with dark brown, and from its infero-interior angle to the inner margin a series of five sinuated black lituræ; the usual longitudinal black streaks on the median areoles, but the upper one much elongated and forking (from its outer extremity) into two clavate lines, which almost reach the outer margin; discoidal stigma white, black-edged; secondaries with the basal half bright ochre-yellow, the external half greyish brown; two transverse central bands, the inner one black, the outer one dusky, dentated, bordered externally by pale grey diffused spots; a large spot at anal angle, its inner half black, its outer half white; fringe of all the wings white, spotted with brown; body grey, irrorated with red-brown; the head and collar with a central longitudinal inverted X-shaped dark-brown marking; tegulæ bordered externally with black, and fringed with white hairs; metathorax with a large central transverse blackish spot; body with a central blackish line, and with lateral increasing longitudinal bands on each segment; antennæ reddish: wings below uniformly whity-brown; the base of primaries yellow to the centre of the discoidal cell; fringe as above; body below white: expanse of wings 3 inches 11 lines.

Hab. Madagascar.

This beautiful species seems to be allied to *Sphinx jasmini* of Boisduval; but the coloration of the secondaries and the uniform character of the under surface at once distinguish it.

PROTOPARCE LINGENS, n. sp.

Primaries above greyish brown, crossed by ill-defined black lunulated interrupted lines, most strongly defined over the central area; an oblique blackish band across the end of the cell, and not extending beyond the median nervure; the usual longitudinal black streaks on the median interspaces; a black-bordered apical patch as in *Diludia*; fringe alternately white and brown, a black-edged white discoidal stigma; secondaries ochreous, sordid towards apex; costal area testaceous; a broad y-shaped central transverse black band; a submarginal black band, tapering from the apex to the anal angle; outer border greyish brown; anal margin white; fringe alternately white and brown; body above brown; back of collar black; tegulæ bordered externally with black and fringed with white; two black-bordered yellow spots on metathorax; hind margin of thorax black; abdomen with a central longitudinal interrupted black line from the second to the fifth segment; a central white spot on the basal segment; a lateral series of black-bordered oblique white spots; hind margin of the segments white-edged; antennæ whity-brown, ferruginous internally; proboscis castaneous: wings below pale brown, the basicostal area of primaries, and the basal half of secondaries sandy brown; body below white, the palpi and front of pectus testaceous: expanse of wings 3 inches 4 lines; length of body 1 inch 7 lines, of proboscis extended 3 inches 5 lines, of antennæ 10 lines.

Hab. Madagascar.

Considering the size of this species, the length of its proboscis and of its antennæ are remarkable. It is most nearly allied to *P. solani*, but is a well-defined and very distinct species.

CHALCOSIIDÆ.

CYCLOSIA UNIFORMIS, n. sp.

Dull brown, shot with dark dull green, as in *C. panthera*, but with no trace of the conspicuous maculated white border common to that species; expanse of wings 2 inches.

Hab. Sarawak (*Low*).

A very distinct species. It occurs also in Sumatra.

MIMEUPLŒA, n. gen.

Allied to *Cyclosia* and *Pompelon*, general aspect of *Amesia*, coloration of the Rhopalocerous genera *Euplœa* and *Calliplœa*.

This genus differs from both *Cyclosia* and *Pompelon* in the less-rounded form of the primaries, the longer inner margin of these wings, the great length of the median and shortness of the subcostal nervures; the discoidal cell is consequently longer behind than in front, and is deeply and angularly excavated in front; the upper radial is emitted with the third subcostal branch from a short footstalk, whereas the lower radial is not emitted from the same point with the third median branch as in *Cyclosia* and *Pompelon*; the abdomen extends also beyond the secondaries. Type

MIMEUPLŒA RHADAMANTHA, n. sp.

Wings above rich chocolate-brown, becoming slightly purplish towards outer margin; primaries with a broad subquadrate white patch over the end of the cell; immediately below the latter and upon the second median interspace a fusiform white streak; three submarginal white dashes towards the external angle; a lilac dot at base; secondaries with the internal half of the basal third occupied by a large white patch; body dark brown; front of head and back of collar dull blue; anal half of abdomen blue-shot: wings below nearly as above; body brown, laterally spotted with white, venter shot with blue; legs brown above, pearly white below; expanse of wings 2 inches, 6 lines.

Hab. Sarawak (*Low*).

Resembles the female of *Calliplœa rhadamanthus*, which occurs with it in Borneo; I know of no other Moth at all nearly allied to it.

4. Descriptions of a new Species of *Bulimus* from Western Australia, and of a *Paludinella* from Lake Eyre, South Australia. By GEORGE FRENCH ANGAS, F.L.S., C.M.Z.S.

[Received February 19, 1877.]

(Plate XXVI.)

BULIMUS PONSONBII, n. sp. (Plate XXVI. fig. 1.)

Shell imperforate, elongately ovate, solid, shining, everywhere marked with very fine decussated transverse striæ crossing the lines of growth, rich olive-brown without any markings, paler towards the apex; whorls 5, slightly convex; spire conical, blunt at the apex; aperture pale lilac within, longer than the spire, wider towards the base; outer lip simple; columella arcuate, the margins united by a strong spreading callus.

Long. 2 inches 2 lines, lat. 1 inch.

Hab. Western Australia.

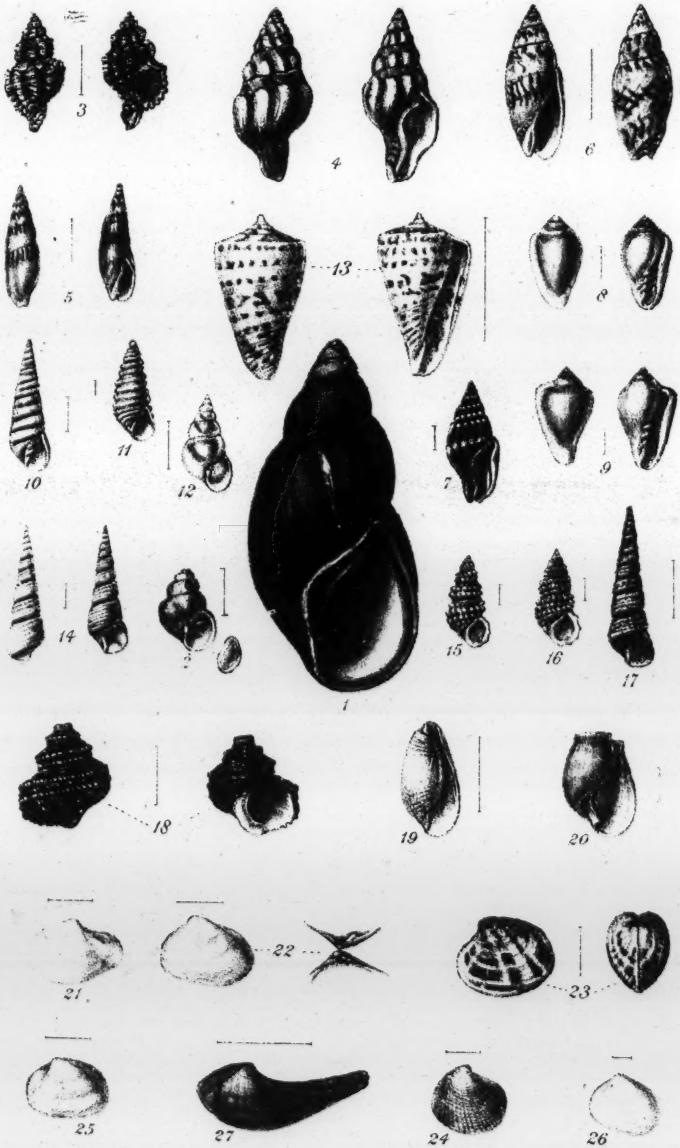
This species appears to have been hitherto overlooked by authors, or confounded in some unaccountable manner with the *Bulimus atomatus* of Gray, from New South Wales, from which it is altogether distinct.

I found three examples in the British Museum labelled *B. atomatus*, var., with a note on the back of the tablet stating that they were obtained by Mr. John Gould in Western Australia in 1839.

Mr. J. H. Ponsonby, having lately shown me a specimen from his collection, drew my attention to the species, which I have much pleasure in naming after him.

PALUDINELLA GILESI, n. sp. (Plate XXVI. fig. 2.)

Shell perforate, globosely turbinate, rather thin, pale orange,



G.H.Sowerby lith

M.& N.Hanhart imp

NEW SPECIES OF SHELLS FROM AUSTRALIA



showing here and there narrow, transverse, somewhat diaphanous lines of a dark colour, very finely longitudinally striated with the lines of growth; whorls 5, very convex, the last inflated; sutures impressed; aperture subcircular; outer lip simple, arcuate; margins united by a broad, flattened, whitish callus, which is expanded over the columella and somewhat produced at the base.

Operculum horny, paucispiral, with the nulceus subcentral.

Long. 4, lat. 2½ lin.

Hab. Shores of Lake Eyre, South Australia (*Waterhouse*).

5. Descriptions of one Genus and twenty-five Species of Marine Shells from New South Wales. By GEORGE FRENCH ANGAS, F.L.S., C.M.Z.S., &c.

[Received February 19, 1877.]

(Plate XXVI.)

MUREX BRAZIERI, n. sp. (Plate XXVI. fig. 3.)

Shell elongately ovate, solid, light brown, tinged with brownish purple on the columella and within the aperture, varied with six irregular varices; whorls 5, somewhat excavated and flattened above, the upper ones encircled with two, and the last with five strong erect ribs, some of which are double, crossed longitudinally with squamate ridges throughout, which are nodulous on the ribs, and become more foliaceous towards the base; aperture ovate, outer lip dentate within; canal half the length of the aperture, slightly recurved.

Long. 4, lat. 2 lin.

Hab. Dredged outside Port-Jackson Heads in 20 fathoms (*Brazier*).

This little species is somewhat allied to *Murex mundus* of Reeve.

PERISTERNIA BRAZIERI, n. sp. (Plate XXVI. fig. 4.)

Shell fusiform, moderately solid, light yellowish brown, longitudinally ribbed with about eight broad ribs, tumid above, which become obsolete towards the anterior portion of the basal whorl, crossed with numerous fine, impressed, concentric lines, especially on the upper whorls; whorls 6½, slightly flattened below the sutures; sutures irregularly impressed; aperture narrowly ovate; outer lip with a small blunt tooth anteriorly; columella arcuate, with a slight callous projection close to its junction with the outer lip; canal moderate, very slightly exserted and recurved.

Length 1 inch, breadth 5 lines.

Hab. Near Redbank River, New South Wales (*Brazier*).

The tooth-like projection just inside the outer lip, at the upper portion of the canal, is only present in fully adult specimens. The slight fold in the columella, characteristic of *Peristernia*, is either absent or but very faintly developed in the present species.

TRUNCARIA AUSTRALIS. (Plate XXVI. fig. 5.)

Shell elongately fusiform, moderately solid, pale brown, shining; whorls 7½, the two apical ones thin and papillose, the rest somewhat distantly and flatly longitudinally plicate on the upper portion, the plicæ crossed with fine impressed lines, the middle of the last whorl smooth with a few impressed lines near the base; sutures grooved; aperture narrowly ovate, dilated below; outer lip arcuate, slightly thickened within; columella somewhat flattened, covered with a smooth white callus, and abruptly truncate at the base.

Length 3¼ lines, breadth 1 line.

Hab. Dredged off "Sow and Pigs," Port Jackson (*Brazier*).

OLIVELLA BRAZIERI, n. sp. (Plate XXVI. fig. 6.)

Shell elongately ovate, smooth, shining, pale flesh-colour, ornamented with several irregular distant chestnut-coloured flames descending from the sutures, and with zigzag lines and markings which become thicker and more distinct towards the centre of the last whorl, forming a sort of zone, below which is a narrow impressed pale band, the markings again appearing in a fainter form towards the base; whorls 6; sutures excavated; aperture longer than the spire; outer lip simple, nearly straight, truncate at the base; columella slightly twisted and plicate below, with a narrow keel extending round the base of the whorl.

Long. 6, lat. 2½ lin.

Hab. Newcastle beach, New South Wales.

COLUMELLA (ANACHIS) SMITHI, n. sp. (Plate XXVI. fig. 7.)

Shell elongately ovate, moderately solid, purplish olive, with a band of white dots just below the suture, and another encircling the middle of the last whorl; whorls 6, strongly and closely longitudinally ribbed, the ribs becoming evanescent towards the base of the lower whorl, which is transversely grooved; aperture narrowly subquadrate; canal short, everted and recurved.

Long. 1¾, lat. ¾ lin.

Hab. Port Jackson; under stones at low water.

In sculpture this species much resembles *C. atrata*, Gould; but it is less than half the size, and of a purplish-olive colour, with white-dotted bands.

I have named it after Mr. Edgar Smith, who so ably superintends the Conchological Department in the British Museum.

MARGINELLA STRANGEI, n. sp. (Plate XXVI. fig. 8.)

Shell elongately ovate, rather thin, smooth, shining, semitransparent, white, somewhat suffused with pale yellowish brown on the body-whorl, and with an opaque white band below the suture; whorls 4; spire small, obtuse, apex blunt; aperture narrow; outer lip thickened and strongly varied, varices opaque white; columella 4-plaited.

Long. 1¾, lat. 1¼ lin.

Hab. "Sow and Pigs" reef, Port Jackson (*Brazier*).

MARGINELLA METCALFI, n. sp. (Plate XXVI. fig. 9.)

Shell elongately subtriangularly ovate, rather thin, smooth, polished, creamy white; whorls 4; spire obtusely conical, blunt at the apex; aperture rather narrow; outer lip thickened and slightly varicose; columella 4-plaited, the lowest plait descending.

Long. 2, lat. 1 lin.

Hab. Port Jackson.

More elongated and less triangular than *M. ochracea*, Angas, and wanting the orange effuse band and pale varix of the latter.

OBELISCUS JUCUNDUS, n. sp. (Plate XXVI. fig. 10.)

Shell elongately subulate, smooth, shining, white, with two light-brown bands on each whorl, three on the last one; whorls 9, nearly flat; apex papillary, sinistral; sutures impressed; aperture quadrately ovate; outer lip simple, arcuate; columella with a prominent twisted fold encircling the pillar.

Long. 3, lat. 1 lin.

Hab. Port Jackson, deep water (*Brazier*).

OSCILLA LIGATA, n. sp. (Plate XXVI. fig. 11.)

Shell very minute, elongately pupiform, rather thin, rosy white, transversely, broadly, and prominently ribbed; whorls 6, the apex terminating in a mucro or nipple; aperture quadrately ovate; outer lip simple; interior of the columella furnished with a single small transverse tooth or plait.

Long. 1, lat. $\frac{1}{3}$ lin.

Hab Botany Bay, New South Wales.

This curious little shell is remarkable for its mucronate apex, and its pale pinkish colour. It belongs to the Pyramidellidæ.

STYLIFER BRAZIERI, n. sp. (Plate XXVI. fig. 12.)

Shell rather acuminately ovate, smooth, pellucid, white, polished; whorls 6, rounded, flattened just below the sutures, which are very finely callously marginate; spire elevated, apex styliform; aperture subovate, pointed behind, and rounded in front; outer lip thin, simple; columella arcuate, very slightly thickened above, the margins joined by a thin distinct callus.

Length 2 lines, breadth 1 line.

Hab. "Sow and Pigs," Port Jackson. Parasitic on a species of starfish (*Brazier*).

CONUS METCALFEI, n. sp. (Plate XXVI. fig. 13.)

Shell triangularly elongate, very slightly everted towards the base, ornamented with rows of small distant square or elongated irregular brownish-yellow spots, those in the centre larger and more varied in shape, forming a sort of band, sculptured all over with rows of minute, close-set, oblong punctures more numerous and distinct towards the base, which is encircled by a number of narrow elevated ridges; whorls 7, upper ones slightly concave, spirally striated, and

cancellated with fine, close-set, thread-like lines; apex of the spire elevately produced.

Long. 10, lat. 6 lin.

Hab. Dredged at "Sow and Pigs" reef, Port Jackson (*Brazier*).

A very elegant cone, totally distinct in its characters from any other Australian species.

BITTIUM TURRITELLIFORMIS, n. sp. (Plate XXVI. fig. 14.)

Shell elongately turreted, rather thin, light yellowish brown, inclining to reddish purple on the upper whorls, transversely finely ridged, the interstices very minutely and closely longitudinally striated, the last whorl keeled below, with the base smooth and slightly concave; whorls 10, convex; sutures impressed; aperture roundly ovate; outer lip simple, arcuate; columella somewhat thickened and twisted towards the base, canal short.

Long. 4, lat. 1 lin.

Hab. Port Jackson (*Brazier*).

Were it not for the form of the aperture, this shell might easily be mistaken for a little *Turritella*.

ALVANIA ELEGANS, n. sp. (Plate XXVI. fig. 15.)

Shell minute, imperforate, scalariform, moderately solid, whitish, regularly cancellated by three transverse (on the last whorl four) and several longitudinal ribs, which become sharply nodulous at the intersections; whorls 5, convex, sutures deeply incised; aperture circular; lip flattened and variced externally.

Long. $1\frac{1}{4}$, lat. $\frac{1}{2}$ lin.

Hab. Port Jackson.

This beautifully sculptured species is from shell-sand.

ALVANIA GRACILIS, n. sp. (Plate XXVI. fig. 16.)

Shell imperforate, elevatedly turbinate, moderately solid, light purplish brown; whorls 5, longitudinally ribbed as far as the periphery of the last whorl, and strongly transversely lirate throughout, the intersections producing a regular beaded appearance; the transverse ridges towards the base strongly defined; aperture subcircular, peritreme thickened.

Length $1\frac{1}{4}$, breadth $\frac{1}{2}$ line.

Hab. Port Jackson, from shell-sand (*Brazier*).

TORCULA PARVA, n. sp. (Plate XXVI. fig. 17.)

Shell narrowly acuminately turreted, very pale brown, with an indistinct light-chestnut band at the sutures, transversely very finely ridged, with three rather prominent keels on each whorl; whorls 11, slightly convex; sutures impressed; aperture subquadrate; outer lip simple; columella slightly arcuate above, a little thickened and produced at the base.

Long. $4\frac{1}{2}$, lat. 1 lin.

Hab. Dredged at the "Sow and Pigs" bank, Port Jackson (*Brazier*).

TURBO EXQUISITUS, n. sp. (Plate XXVI. fig. 18.)

Shell small, imperforate, solid, pale greenish buff or light pink, painted with very broad descending flames of an orange colour on the upper portion of the whorls; whorls $4\frac{1}{2}$, angulated at the periphery, flattened above, the upper whorls encircled below the angle with two, and the last whorl with five stout scabrously nodulous ribs; between these and the sutures are four or five smaller and closer ribs of a similar character, and on the base of the last whorl about eight ribs, which are less nodulous and scabrous than those above, the interstices being crossed by fine striæ; spire somewhat elevated; aperture nearly circular; columella thickened, terminating in a blunt callosity at the base; pearly within.

Length 6, breadth $4\frac{1}{2}$ lines.

Hab. Cape Solander, Botany Bay: found after an easterly gale (*Brazier*).

A variety occurs of a brilliant orange-red colour throughout.

CYLICHNA ELEGANS, n. sp. (Plate XXVI. fig. 19).

Shell elongately ovate, umbilicated, rather thin, white, irregularly and faintly longitudinally striated, the striæ more distinct and equal near the apex, transversely ornamented with numerous rows of very fine, close-set, crenate, interrupted lines, which, together with the longitudinal striæ, become very nearly obsolete towards the centre; apex perforate, somewhat tumid around the perforation; aperture narrow above, wider below; outer lip thin, simple; columella short, smooth, very slightly expanded over the umbilicus.

Length 6, breadth 3 lines.

Hab. Port Stephens, New South Wales (*Brazier*).

DIAPHANA BRAZIERI, n. sp. (Plate XXVI. fig. 20.)

Shell subglobose, with a long narrow open umbilicus, thin, hyaline, covered with a fine membranaceous olive epidermis; last whorl inflated; spire flatly depressed; whorls $3\frac{1}{2}$, rounded above, sutures impressed; aperture contracted above, subovate below; outer lip sharply angled posteriorly, slightly sinuous, arcuate below; columella abruptly truncate below the umbilicus.

Length 2 lines, breadth $1\frac{1}{2}$ line.

Hab. "Sow and Pigs," Port Jackson. In 4 fathoms, sandy mud, on weeds (*Brazier*).

ERVILIA AUSTRALIS, n. sp. (Plate XXVI. fig. 21.)

Shell oblong-ovate, equivalve, subequilateral, moderately convex, rather solid, white, with one or two small light-brown markings on either side of the anterior portion of the dorsal margin, and sometimes on the posterior; finely transversely striated, and on either side crossed with a few delicate radiating lines, which are more numerous in front; umbones small, strongly defined, incurved, approximate; dorsal margins nearly flat; anterior side a little produced; posterior side rounded; ventral margin convex.

Long. $3\frac{1}{2}$, alt. $2\frac{1}{2}$, lat. $1\frac{1}{2}$ lin.

Hab. "Sow and Pigs" bank, Port Jackson (*Brazier*).

Gen. Mysella, Angas.

Shell small, thin, equivalve, inequilateral, quadrately cuneate, concentrically striated. Hinge with a small triangular internal cartilage-pit, close to which is a single small, diverging, subcircular, flattened cardinal tooth in one valve, and with two thin short horizontal lateral processes in the other valve. Siphonal inflection none.

Mysella anomala, n. sp. (Plate XXVI. fig. 22.)

Shell somewhat triangularly ovate, compressed towards the base, rather thin, anterior side shortest, white, covered towards the edges with a pale brown epidermis, concentrically very finely and regularly ridged; dorsal margins nearly straight, anterior side somewhat compressed and subtruncate; posterior side rounded; ventral margin scarcely convex; umbones a little tumid; beaks small, incurved, approximate.

Long. 5, alt. 4, lat. 2 lin.

Hab. Shark Island, Port Jackson, in black mud, 12 fathoms (*Brazier*).

Cytherea sophiæ, n. sp. (Plate XXVI. fig. 23.)

Shell small, roundly ovate, tumid, moderately solid, irregularly concentrically striated with the lines of growth, shining, white, painted with a narrow longitudinal band of irregular bright-chestnut markings on the anterior side of the valves, and a broader one of larger markings on the posterior side, leaving a white ray in the centre; umbones tinged with yellow and carnation-red; lunule distinct.

Long. 6, alt. 5, lat. 4 lines.

Hab. Cape Solander, Botany Bay, after an easterly gale (*Brazier*).

The small size, rounded form, and rich colouring of the umbones lead me to consider this shell a distinct species from any of its allies. I have much pleasure in naming it after Mrs. Brazier.

Lucina (Codakia) quadrata, n. sp. (Plate XXVI. fig. 24.)

Shell quadrately ovate, moderately solid, subventricose, very inequilateral, yellowish white, very finely concentrically striated throughout, the striæ becoming slightly undulating and scabrous towards the base, where they are crossed on either side by broader radiating flattened ridges; dorsal margin concavely excavated anteriorly, nearly straight and rapidly descending posteriorly; ventral margin arcuate, rounded in front; umbones acute, incurved, approximate; dorsal area excavated.

Long. 2, alt. 1½, lat. 1 lin.

Hab. Shark Island, Port Jackson.

Kellia solida, n. sp. (Plate XXVI. fig. 25.).

Shell somewhat quadrately ovate, rather tumid, inequilateral, anterior side the shortest, solid, opaque, white, shining, smooth and polished at the umbones, showing irregular concentric lines towards the base; umbones small, distinct, approximate; anterior side

obtuse, posterior side arcuate; dorsal margin arched, basal margin very slightly arcuate.

Long. 3½, alt. 2½, lat. 1¾ lines.

Hab. "Bottle and Glass" rocks, Vaucluse Bay, Port Jackson (*Brazier*).

A very solid, pure white, shining species, more oblong than most others of the genus.

NUCULA PUSILLA, n. sp. (Plate XXVI. fig. 26.)

Shell minute, obliquely and triangularlarly ovate, subventricose, inequilateral, rather thin, pale greenish white, under the lens very finely concentrically striated, and crossed with exceedingly delicate radiating hair-like lines; dorsal margin sloping and convex posteriorly, shorter in front; ventral margin arcuate; umbones tumid, approximate.

Long. 1½, alt. 1, lat. ⅔ lin.

Hab. Port Jackson, in shell-sand (*Brazier*).

LEDA ENSICULA, n. sp. (Plate XXVI. fig. 27.)

Shell equivalve, very inequilateral, depressed, ovately oblong, the anterior side attenuated into a long narrow rostrum curving upwards, rather thin, whitish, covered with a delicate pale olive-coloured epidermis, finely and irregularly concentrically striated by the lines of growth, with a few very faint striæ radiating anteriorly from the umbones; dorsal margin concave in front and excavated on both sides with two narrow diverging ridges extending from the beaks to the end of the rostrum, the space between them being crossed with fine striæ, short and convex behind; posterior side bluntly angled; ventral margin arcuate; beaks small, distinct, approximate, incurved.

Long. 7, alt. 3, lat. 1⅛ line.

Hab. Brought up from a depth of 45 fathoms on the "tangles" of the dredge, off Port-Jackson Heads (*Brazier*).

A very remarkable shell, quite unlike any other Australian form of the genus at present known.

EXPLANATION OF PLATE XXVI.

Fig. 1. *Bulimus ponsonbii*, p. 170.
2. *Paludinella gilesi*, p. 170.
3. *Murex brazieri*, p. 171.
4. *Peristernia brazieri*, p. 171.
5. *Truncaria australis*, p. 172.
6. *Olivella brazieri*, p. 172.
7. *Columella* (*Anachis*) *smithi*, p. 172.
8. *Marginella strangei*, p. 172.
9. —— *metcalfi*, p. 173.
10. *Obeliscus jucundus*, p. 173.
11. *Oscilla ligata*, p. 173.
12. *Stylifer brazieri*, p. 173.
13. *Conus metcalfi*, p. 174.
14. *Bittium turritelliformis*, p. 174.
15. *Alvania elegans*, p. 174.
16. —— *gracilis*, p. 174.
17. *Torcula parva*, p. 174.
18. *Turbo exquisitus*, p. 175.
19. *Cylichna elegans*, p. 175.
20. *Diaphana brazieri*, p. 175.
21. *Ervilia australis*, p. 175.
22. *Mysella anomala*, p. 176.
23. *Cytherea sophiæ*, p. 176.
24. *Lucina* (*Codakia*) *quadrata*, p. 176.
25. *Kellia solida*, p. 176.
26. *Nucula pusilla*, p. 176.
27. *Leda ensicula*, p. 177.

6. A further List of Additional Species of Marine Mollusca to be included in the Fauna of Port Jackson and the adjacent Coasts of New South Wales. By GEORGE FRENCH ANGAS, F.L.S., F.R.G.S., C.M.Z.S., &c.

[Received February 19, 1877.]

In the year 1867 I published in these 'Proceedings' a list of the Marine Mollusks of Port Jackson and the coast of New South Wales, amounting in all to 408 species[1]. In 1871 I gave an additional list, comprising 109 more species[2]. I am now enabled, through the indefatigable researches of Mr. Brazier, and from other sources, to add a further list of 140 univalves, and 36 bivalves; thus bringing up the number of species of Marine Mollusca at present known to inhabit the coast of New South Wales to a grand total of 693.

Class CEPHALOPODA.

Fam. NAUTILIDÆ.

1. NAUTILUS POMPILIUS, Linn.
Cast ashore at Coff's Harbour, north of the Bellinger River.

2. NAUTILUS MACROMPHALUS, Sow.
Same locality as *N. pompilius*.

Class PTEROPODA.

Fam. CAVOLINIDÆ.

3. CAVOLINA GIBBOSA, Rang.
Found washed up on exposed beaches all along the coast.

4. CAVOLINA FLAVA, D'Orb.
Obtained in the dredge at night, in Port Jackson.

5. CAVOLINA QUADRIDENTATA, Lesueur.
On exposed beaches.

6. CAVOLINA LONGIROSTRIS, Lesueur.
Obtained in the dredge with *C. flava*, in Port Jackson.

7. CAVOLINA LIMBATA, D'Orb.
On exposed beaches.

8. CAVOLINA INFLEXA, Lesueur.
On exposed beaches.

9. DIACRIA MUCRONATA, Quoy & Gaim.
Port Stephens.

10. STYLIOLA SUBULATA, Quoy & Gaim.
On exposed beaches.

[1] See P. Z. S. 1867, pp. 185, 908, 912. [2] See P. Z. S. 1871, p. 87.

Fam. Tripteridæ.

11. Triptera columnella, Rang.

On exposed beaches.

Class GASTEROPODA.

Proboscidifera.

Fam. Muricidæ.

12. Murex brazieri, Angas, P.Z.S. 1877, p. 171, pl. xxvi. fig. 3.

A minute, imbricately sculptured species, having the two central transverse liræ double.

Dredged outside Port-Jackson Heads in 20 fathoms (*Brazier*).

13. Murex (Chicoreus) cervicornis, Lam.; Reeve, Conch. Icon. *Murex*, pl. 16.

Brought up in the dredge, 25 miles off Montagu Island, coast of New South Wales, from a very great depth, in company with *Cypreovula umbilicata*, *Voluta papillosa*, and a large species of *Limopsis* ('Challenger' Expedition, *teste Brazier*).

Subfamily Fusinæ.

14. Fusus laticostatus, Desh.

Beaches near Redbank River, New South Wales (*Brazier*).

15. Fusus novæ-hollandiæ, Reeve.

Cape Solander, Botany Bay (*Brazier*).

Fam. Fasciolariidæ.

16. Peristernia brazieri, Angas, P.Z.S. 1877, p. 171, pl. xxvi. fig. 4.

Redbank River, New South Wales (*Brazier*).

Although in this species the fold on the columella is wanting, its general characters partake more of those of *Peristernia* than of *Fusus*.

Fam. Tritoniidæ.

17. Tritonium (Simpulum) gemmatum, Reeve.

Cape Banks, Botany Bay (*Brazier*).

18. Tritonium (Gutturnium) caudatum, Gmel.

Triton canaliferus, Lam.; Reeve, Conch. Icon. pl. iii. fig. 8.

Port Stephens and near mouth of Macleay River.

19. Tritonium (Epidromus) coxi, Brazier, P.Z.S. 1872, pl. iv. fig. 9.

Near Bellenger River (*Brazier*).

20. Bursa (Lampas) hians, Schum.

Murex lampas, Linn.

Triton lampas, Reeve, Conch. Icon. pl. ix. f. 30.

Near mouth of Macleay River (*Brazier*).

21. Bursa (Lampas) granifera, Lam.
Ranella granifera, Lam. Enc. Méth. pl. 414. fig. 4.
Near Macleay River.

22. Bursa (Lampas) venustula.
Ranella venustula, Reeve, Conch. Icon. pl. vii. fig. 37.
Taken alive at "Bottle and Glass" rocks, Port Jackson, by Mr. Rossiter.

23. Bursa (Apollon) anceps, Lam.
Port Stephens (*Brazier*).

Fam. Buccinidæ.

24. Cominella alveolata, Kien.
Twofold Bay. Ranges westward to Port Lincoln.

Subfamily Nassinæ.

25. Nassa (Niotha) gemmulata, Lam.
Near Redbank River (*Brazier*).

26. Nassa (Hima) decussata, Kien.
Brisbane Water (*Strange*).

Nassa (Alectrion) intermedia, Dunker, 'Novara' Exp. Moll. tab. i. fig. 2.
In my first list, I gave this species as *N. suturalis*, var. (*Buccinum suturale*, Lam.). It must now stand as *N. intermedia*, Dunker.
Port Jackson.

27. Nassa (Alectrion) spirata, A. Ad. P. Z. S. 1851, p. 106.
Broken Bay, and Port Stephens (*Brazier*).

28. Truncaria australis, Angas, P. Z. S. 1877, p. 172, pl. xxvi. fig. 5.
"Sow and Pigs" bank, Port Jackson (*Brazier*).

Subfam. Purpurinæ.

29. Purpura (Cronia) anomala, Angas, P. Z. S. 1877, pl. v. fig. 1.
Dredged in 25 fathoms outside Port-Jackson Heads (*Brazier*).

30. Ricinula (Sistrum) adelaidensis, Crosse, Journ. de Conch. 1865, pl. ii. fig. 1.
Jervis Bay. Common in South Australia.

Fam. Dactylidæ.

31. Oliva erythrostoma, Lam.
Near Redbank River (*Brazier*).

32. Olivella brazieri, Angas, P. Z. S. 1877, p. 172, pl. xxvi, fig. 6.
Newcastle beach, New South Wales (*Brazier*).

Fam. Fasciolariidæ.

33. Fasciolaria coronata, Lam.

Twofold Bay. Ranges westward to the Great Australian Bight.

34. Latirus strangei, A. Ad. P. Z. S. 1854, p. 316.

Port Jackson (*Stronge*).

Fam. Volutidæ.

35. Volutella papillosa, Swainson.

Voluta papillaris, Reeve, Conch. Icon. pl. iv. fig. 10.

Obtained in the dredge in very deep water near Montagu Island, 25 miles off the coast of New South Wales (*Brazier*).

36. Scapha mamilla, Gray.

Found on the beach near Lake Macquarie (*Brazier*).

37. Callipara brazieri, Cox, P. Z. S. 1873, pl. xlviii. fig. 8.

Little River. Wooli Wooli, near mouth of the Clarence river (*Brazier*).

The type of Dr. Gray's genus *Callipara* is the *Voluta bullata*, Swainson, from Algoa Bay, South Africa. Another Australian species of this curious genus has been found at Nicol Bay, on the north-west coast, and described by Dr. Cox (P. Z. S. 1871, pl. xxxiv. fig. 5) as *V. coniformis*.

38. Microvoluta australis, Angas, P. Z. S. 1877, pl. v. fig. 2.

Dredged in 25 fathoms outside Port-Jackson Heads (*Brazier*).

This singular little shell has somewhat the aspect of a *Voluta fulgetrum* in miniature; but the deep siphonal notch and the toothed projection of the base of the pillar are wanting, the base being rounded and spout-shaped.

Fam. Mitridæ.

39. Mitra (Nebularia) badia, Reeve.

Shark Island, Port Jackson (*Brazier*).

Subfam. Columbellinæ.

40. Columbella tyleri, Gray.

Near Bellenger River (*Brazier*).

41. Columbella (Anachis) smithi, Angas, P. Z. S. 1877, p. 172, pl. xxvi. fig. 7.

A minute brown species zoned with white dots. Under stones in Port Jackson.

The *C. lentiginosa* of Reeve (*not* Hinds) is from North Australia. I propose that it should be called *C. darwini*.

42. COLUMBELLA SPECIOSA, Angas, P. Z. S. 1877, pl. v. fig. 3.

Port Jackson (*Brazier*).

Columbella dermestoides, Kiener, in my List in P. Z. S. 1867, p. 195, must be altered to *C. lineolata*, Pease.

Columbella interrupta, Angas, has been altered to *C. angasi*, Brazier, the former name being preoccupied.

Fam. MARGINELLIDÆ.

43. MARGINELLA ANGASI, Brazier, MS.; Crosse, Journ. de Conch. 1870, p. 304.

Port Jackson. "Bottle and Glass" rocks.
An extremely minute, hyaline species.

44. MARGINELLA STRANGEI, Angas, P. Z. S. 1877, p. 172, pl. xxvi. fig. 8.

"Sow and Pigs" bank, Port Jackson (*Brazier*).

45. MARGINELLA METCALFI, Angas, P. Z. S. 1877, p. 173, pl. xxvi. fig. 9.

Port Jackson (*Brazier*).

46. PORCELLANA RUFULA, Gask. MS.; Reeve, Conch. Icon. *Marginella*, fig. 149.

Outside Port-Jackson Heads, 25 fathoms (*Brazier*).
A beautiful little shell with an elongated spire and two coloured bands. The type specimen from Mr. Taylor's collection, now in the British Museum, is from the Cape of Good Hope, and of a roseate hue; the Australian specimens obtained by Mr. Brazier have yellow bands.

47. ERATO ANGIOSTOMA, Sow. Thes. Conch.

Outside Port-Jackson Heads (*Brazier*).
An elegantly shaped species, with the outer lip angulated and produced at the upper part.

48. ERATO CORRUGATA, Hinds.

Vaucluse Bay, sandy mud, 8 fathoms (*Brazier*).

Fam. SYCOTYPIDÆ.

49. SYCOTYPUS RETICULATUS, Lam.

Near the mouth of the Macleay river.

Fam. NATICIDÆ.

50. NATICA ALA-PAPILIONIS, Chem.

Port Stephens and near Redbank River.

51. NATICA (RUMA) FILOSA, Sow. MS. in Mus. Cuming.

Natica filosa, Reeve, Conch. Icon. pl. xvii. fig. 72.
Farm Cove, Port Jackson, in 5 fathoms. Port Stephens, after gales.

52. Natica colliei, Recluz (=*N. concinna*, Dunker).
Parramatta river, New South Wales, 7 fathoms (*Brazier*).

53. Naticina coarctata, Reeve.
New South Wales (*Brazier*).

Fam. Cassididæ.

54. Semicassis paucirugis, Menke.
Merimbula and Twofold Bay (*Brazier*).

55. Semicassis coronulata, Sow. Tank. Cat.
Port Stephens; Macleay River (*Brazier*).

56. Semicassis torquata, Reeve.
Macleay river.

57. Semicassis areola, Linn.
Bellenger and Macleay river-beaches, and southwards to Broken Bay (*Brazier*).

58. Semicassis saburon, Adanson.
Macleay, Bellenger, Nambuccra, and Redbank beaches.

59. Semicassis sophiæ, Brazier, P. Z. S. 1872, p. 617.
Macleay and Nambuccra.

60. Semicassis pila, Reeve.
Near Redbank River (*Brazier*).

Fam. Scalidæ.

61. Scala clathrus, Linn.
Port Stephens and Broken Bay (*Brazier*).

62. Cirsotrema hyalina, Sow.
"Sow and Pigs" bank, 5 fathoms (*Brazier*).

Fam. Pyramidellidæ.

63. Turbonilla festiva, Angas, P. Z. S. 1877, pl. v. fig. 4.
Port Jackson, deep water (*Brazier*).

For *Turbonilla nitida*, Angas, in my first list of Port-Jackson shells, read *T. hofmani*, there being a species from Japan described by Arthur Adams under the name *nitida* in the 'Annals' for 1860.

64. Obeliscus jucundus, Angas, P. Z. S. 1877, p. 173, pl. xxvi. fig. 10.
Port Jackson (*Brazier*).

65. Oscilla ligata, Angas, P. Z. S. 1877, p. 173, pl. xxvi. fig. 11.
Botany Bay, New South Wales (*Brazier*).

66. Cingulina brazieri, Angas, P. Z. S. 1877, pl. v. fig. 5.
Port Jackson.

Fam. Styliferidæ.

67. Apicalia guentheri, Angas, P. Z. S. 1877, pl. v. fig. 6.

New South Wales (*Mus. Brit.*).

68. Stylifer brazieri, Angas, P. Z. S. 1877, p. 173, pl. xxvi. fig. 12.

"Sow and Pigs," parasitic on a Starfish (*Brazier*).

This appears to be a true *Stylifer*: it has a more elongated spire than the typical species; and the sutures are finely callously margined.

Fam. Cerithiopsidæ.

69. Cerithiopsis purpurea, Angas, P. Z. S. 1877, pl. v. fig. 7.

Dredged off Shark Island, Port Jackson (*Brazier*).

70. Triforis maculosus, A. Ad.

Port Jackson (*Brazier*).

Fam. Architectonicidæ.

71. Architectonica perspectiva, Linn.

Near the mouth of the Macleay river (*Brazier*).

72. Torinia infundibuliformis, Chemn.

On the beach near Newcastle, New South Wales (*Brazier*).

This species differs from *T. straminea*, Lam.. in the form and character of the umbilicus.

Toxifera.

Fam. Conidæ.

73. Conus (Coronaxis) minimus, Linn.

Near Bellenger and Redbank rivers (*Brazier*).

74. Conus metcalfi, Angas, P. Z. S. 1877, p. 174, pl. xxvi. fig. 13.

"Sow and Pigs" bank, 4 fathoms (*Brazier*).

A very elegantly painted cone, of which one living specimen only has yet been obtained.

75. Conus smithi, Angas, P. Z. S. 1877, p. 36, pl. v. fig. 8.

Cape Solander, Botany Bay.

Fam. Turridæ.

76. Drillia æmula, Angas, P. Z. S. 1877, p. 36, pl. v. fig. 9.

Coast of New South Wales; also New Zealand.

77. Clathurella brenchleyi, Angas, P. Z. S. 1877, pl. v. fig. 12.

Port Stephens (*Brazier*).

78. Clathurella rufozonata, Angas, P. Z. S. 1877, pl. v. fig. 13.

Port Jackson.

79. Clathurella pustulata, P. Z. S. 1877, p. 38, pl. v. fig. 14.
Port Jackson (*Brazier*).

80. Clathurella modesta, Angas, P. Z. S. 1877, p. 38, pl. v. fig. 15.
Port Jackson (*Brazier*).

81. Mangelia jacksonensis, Angas, P. Z. S. 1877, pl. v. fig. 10.
Dredged off Port-Jackson Heads in 25 fathoms (*Brazier*).

82. Mangelia flavescens, Angas, P. Z. S. 1877, pl. v. fig. 11.
Port Jackson (*Brazier*).

83. Mangelia lallemantiana.
Pleurotoma lallemantiana, Crosse, Journ. de Conch. 1865.
North and Middle Harbours, Port Jackson (*Brazier*).

84. Mangelia vincentina.
Pleurotoma vincentina, Crosse, Journ. de Conch. 1865.
Dredged off Port-Jackson Heads; Cabbage-Tree Bay (*Brazier*).
The figure given in the French Journal of this species is so bad, no one could recognize it. The shell is white, with a row of brown spots between the ribs a littte below the sutures, and sometimes with a central band on the last whorl. Crosse figures it of a uniform brown colour.

Fam. Terebridæ.

85. Terebra gunni, Reeve.
In 45 fathoms, due east of Port Jackson, and in 20 fathoms, Jervis Bay (*Brazier*).

86. Terebra marmorata, Desh. P. Z. S. 1859, p. 279.
Near Redbank River (*Brazier*).

87. Acus (Hastula) spectabilis, Hinds.
Near Redbank River (*Brazier*).

88. Acus (Euryta) brazieri, Angas, P. Z. S. 1875, pl. xlv. f. 5.
Dredged off Port-Jackson Heads in 25 fathoms (*Brazier*).

Rostrifera.

Fam. Strombidæ.

89. Strombus (Canarium) plicatus, Lam.
Near the Nambuccra river (*Brazier*).

90. Strombus (Canarium) elegans, Sow.
"Sow and Pigs" reef, Port Jackson (*Brazier*).

91. Strombus (Gallinula) campbelli, Gray.
Port Stephens (*Brazier*).

92. HARPAGO (MILLIPES) SCORPIO, Linn.

"Bottle and Glass" rocks, Port Jackson (*Brazier*).

Fam. CYPRÆIDÆ.

93. CYPRÆA MILARIS, Linn.

Macleay-River Heads (*Brazier*).

94. CYPRÆA CAPUT-ANGUIS, Philippi.

Shark Island, Port Jackson; Botany Bay; Lake Macquerie, &c. (*Brazier*).

Fam. AMPHIPERASIDÆ.

95. AMPHIPERAS OVUM, Linn.

Near Bellenger River (*Brazier*).

96. AMPHIPERAS DENTATA, Ad. & Reeve.

"Sow and Pigs" bank, Port Jackson (*Brazier*).

A beautiful little species of a purplish flesh-colour, with a pale band.

97. AMPHIPERAS PUNCTATA, Duclos.

Port Stephens (*Brazier*).

98. VOLVA VOLVA, Linn.

Port Stephens (*Brazier*).

99. VOLVA PHILLIPINARUM, Sow.

Port Stephens (*Brazier*).

Fam. CANCELLARIIDÆ.

100. CANCELLARIA (TRIGONOSTOMA) ANTIQUATA, Hinds.

Dredged in 7 fathoms off Green Point, Port Jackson; also cast ashore after gales at Port Stephens, and near Redbank River (*Brazier*).

101. CANCELLARIA (TRIGONOSTOMA) COSTIFERA, Sow., var.

A dwarf variety. Port Stephens (*Brazier*).

Fam. CERITHIIDÆ.

102. CERITHIUM CARBONARUM, Phil., var.

Redbank River, New South Wales (*Brazier*).

This appears to be a dark-brown-coloured variety of Philippi's species, which is stated to come from Samoa.

Subfam. POTAMIDINÆ.

103. BITTIUM TURRITELLIFORMIS, Angas, P. Z. S. 1877, p. 174, pl. xxvi. fig. 14.

Port Jackson (*Brazier*).

Fam. Littorinidæ.

104. Littorina undulata, Gray.
Port Stephens (*Brazier*).

Fam. Rissoidæ.

Rissoina turricula, Angas, P. Z. S. 1867 (name preoccupied), is *R. angasi* of Pease.
Rissoina smithi, Angas, P. Z. S. 1867, is *R. fasciata*, A. Ad. P. Z. S. 1851. (Former name must be cancelled.)

105. Rissoina hanleyi, Schwartz.
Port Jackson (*Brazier*).
Smaller than *R. fasciata*. White, variously banded with purple and brown.

106. Rissoa frauenfeldi, Schwartz; Dunker, Voy. 'Novara,' pl. ii. fig. 13.
Shark Island, Port Jackson.

107. Alvania olivacea, Dunker, Voy. 'Novara,' pl. ii. fig. 14.
Port Jackson, under stones.

108. Alvania salebrosa, Dunker, Voy. 'Novara,' pl. ii. fig. 15.
Bondi, Botany, and Coodgee Bays.

109. Alvania gracilis, Angas, P. Z. S. 1877, p. 174, pl. xxvi. fig. 16.
Port Jackson. Shell-sand (*Brazier*).

110. Alvania elegans, Angas, P. Z. S. 1877, p. 174, pl. xxvi. fig. 15.
Port Jackson. Shell-sand (*Brazier*).

111. Sabinæa flaminea, Dunker, Voy. 'Novara,' pl. ii. fig. 18.
Bondi and Coodgee Bays.

112. Sabinæa incidata, Dunker, Voy. 'Novara,' pl. ii. fig. 19.
Botany and Coodgee Bays.

113. Anabathron contabulata, Dunker, Voy. 'Novara,' pl. ii. fig. 20.
Coodgee and Botany Bays.

114. Setia atropurpurea, Dunker, Voy. 'Novara,' pl. ii. fig. 21.
Botany, Bondi, and Coodgee Bays.

115. Setia nitens, Dunker, Voy. 'Novara,' pl. ii. fig. 22.

116. Cingula australiæ, Dunker, Voy. 'Novara,' pl. ii. fig. 23.

Fam. Turritellidæ.

117. Turritella (Haustator) gunni, Reeve.
Twofold Bay (*Brazier*).

118. Turritella (Haustator) incisa, Reeve.

Port Jackson, deep water (*Strange*).

119. Torcula parva, Angas, P. Z. S. 1877, p. 174, pl. xxvi. fig. 17.

"Sow and Pigs" bank, Port Jackson (*Brazier*).

Fam. Calyptræidæ.

120. Calyptræa porosa, Reeve, Conch. Icon. fig. 20.

"Sow and Pigs" bank, Port Jackson, four fathoms (*Brazier*).

The specimen obtained by Mr. Brazier is less corrugated than the type specimen, and is probably a young shell.

Order SCUTIBRANCHIATA.

Podophthalma.

Fam. Neritidæ.

121. Nerita rumphii, Récluz.

Near Redbank River.

Fam. Trochidæ.

122. Turbo petholatus, Linn.

Middle Harbour, Port Jackson, and northwards to the Clarence river (*Brazier*).

123. Turbo exquisitus, Angas, P. Z. S. 1877, p. 175, pl. xxvi. fig. 18.

Cape Solander, Botany Bay; washed on shore after an easterly gale (*Brazier*).

This little species is elaborately and beautifully sculptured; one specimen is clouded with pale brown, red, and white; the other is of a uniform coral-red colour. Its nearest ally is *T. gemmatus*, Reeve, from the Taylor collection.

124. Clanculus undatus, Lam.

Twofold Bay (*Brazier*). Also found in South Australia.

125. Ziziphinus armillatus, Wood.

Cape Solander, Botany Bay (*Brazier*). Also Encounter Bay, South Australia; and Tasmania.

126. Ziziphinus speciosus, A. Ad. P. Z. S. 1854.

Port Stephens (*Brazier*).

127. Ziziphinus decoratus, Phil.

Brisbane Water (*Strange*).

128. Ethalia brazieri, Angas, P. Z. S. 1877, pl. v. fig. 17.

Shell-sand, "Sow and Pigs" bank, Port Jackson.

129. Cirsonella australis, Angas, P. Z. S. 1877, pl. v. fig. 16.

Shell-sand, Botany Bay, New South Wales.

EDRIOPHTHALMA.

Fam. FISSURELLIDÆ.

"*Emarginula dilecta*, A. Ad. P. Z. S. 1851" (no. 211 in my first list of New-South-Wales Marine Mollusca, P. Z. S. 1867), should be altered to "*E. candida*, A. Ad. P. Z. S. 1851."

Fam. TECTURIDÆ.

130. TECTURA CONOIDEA, Quoy & Gaim.

"Sow and Pigs" reef, Port Jackson (*Brazier*).

TECTIBRANCHIATA.

Fam. ACTÆONIDÆ.

131. MYONIA SINUATA, Angas, P. Z. S. 1877, pl. v. fig. 18.

"Sow and Pigs" bank, Port Jackson (*Brazier*).

Fam. APLUSTRIDÆ.

132. HYDATINA ALBOCINCTA, V. der Hoeven.

Port Stephens (*Brazier*).

Fam. BULLIDÆ.

133. BULLA AMPULLA, Linn.

Port Stephens and Bellinger River (*Brazier*).

134. BULLA (HAMINEA) CUTICULIFERA, Smith, Ann. & Mag. Nat. Hist. May 1872.

Port-Jackson Harbour.

135. BULLA (HAMINEA) CROCATA, Pease.

Lake Macquarie, New South Wales (*Brazier*).

Fam. CYLICHNIDÆ.

136. TORNATINA HOFMANI, Angas, P. Z. S. 1877, p. 39, pl. v. fig. 19.

"Sow and Pigs," Port Jackson.

137. TORNATINA BRENCHLEYI, Angas, P. Z. S. 1877, pl. v. fig. 20.

Dredged outside Port-Jackson Heads in 10 fathoms.

138. CYLICHNA ELEGANS, Angas, P. Z. S. 1877, p. 175, pl. xxvi. fig. 19.

Port Stephens, New South Wales (*Brazier*).

More ovate than others of the genus; beautifully transversely crenulately sculptured.

139. DIAPHANA BRAZIERI, Angas, P. Z. S. 1877, p. 157, pl. xxvi. fig. 20.

"Sow and Pigs," Port Jackson, in sandy mud and weeds, 4 fathoms (*Brazier*).

Only a single specimen of this remarkable shell has been found. Its nearest allies are *Bulla gouldi*, Couthouy, and *Bulla debilis*, Gould, both of which are North-American species.

Fam. LOPHOCERCIDÆ.

140. LOPHOCERCUS DELICATULUS, G. & H. Nevill, Journ. As. Soc. Bengal.

"Sow and Pigs," Port Jackson, amongst weeds on sandy mud (*Brazier*).

The type specimens of Messrs. Nevill are from Ceylon.

Fam. APLYSIIDÆ.

141. DOLABRIFERA BRAZIERI, Sow.

"Bottle and Glass" rocks, Port Jackson (*Brazier*).

142. APLYSIA EXCAVATA, Sow.

Port Jackson.

143. APLYSIA HYALINA, Sow.

Lane Cove, Port Jackson (*Brazier*).

144. APLYSIA SYDNEYENSIS, Sow.

Shark Island, Port Jackson (*Brazier*).

145. APLYSIA ANGASI, Sow.

"Sow and Pigs" reef (*Brazier*).

146. APLYSIA NORFOLKENSIS, Sow.

Shark Island, Port Jackson (*Brazier*).

HETEROPODA.

Fam. IANTHINIDÆ.

147. RECLUZIA HARGREAVESI, Cox, P. Z. S. 1870, pl. xvi. fig. 8.

Found washed ashore at the mouth of the Miall river, Port Stephens.

PULMONIFERA.

Fam. ELLOBIIDÆ.

148. OPHICARDELUS IRREGULARIS, Mouss. Journ. de Conch. 1869.

Port Jackson.

149. OPHICARDELUS MINOR, Mouss.

Port Jackson and Botany Bay.

Class CONCHIFERA

PHOLADACEA.

Fam. PHOLADIDÆ.

1. JOUANNETIA CUMINGI, Sow.

Mouth of Bellinger River in blocks of hard clay (*Brazier*).

Fam. Gastrochænidæ.

2. Humphrevia coxi, Brazier, P. Z. S. 1872, pl. iv. fig. 10.

Near Port Stephens (*Brazier*).

Fam. Anatinidæ.

3. Thracia jacksoniensis, Smith, Journ. Linn. Soc. (Zoology), vol. xii. pl. xxx. fig. 24.

Dredged at "Sow and Pigs" reef, Port Jackson (*Brazier*).

4. Thracia angasiana, Smith, Journ. Linn. Soc. (Zoology), vol. xii. pl. xxx. fig. 23.

"Sow and Pigs," Port Jackson (*Brazier*).

Veneracea.

Fam. Mactridæ.

5. Trigonella eximia, Desh. P. Z. S. 1853.

Dredged alive in Chowder Bay, Port Jackson (*Brazier*).

Fam. Tellinidæ.

6. Tellina (Arcopagia) decussata, Lam.

"Bottle and Glass" rocks, Port Jackson (*Brazier*).

7. Semele scabra, Hanley.

Dredged off Shark Island, Port Jackson, in black mud, 12 fathoms (*Brazier*).

8. Donax (Latona) radians, Lam.

Berry's Bay, Port Jackson, 5 fathoms (white var. *Brazier*).

9. Donax (Serrula) nitidus, Desh.

Dredged in Middle Harbour, 5 fathoms (*Brazier*).

10. Ervilia australis, Angas, P. Z. S. 1877, p. 175, pl. xxvi. fig. 21.

"Sow and Pigs" bank, Port Jackson (*Brazier*).

11. Mysella anomala, Angas, P. Z. S. 1877, p. 176, pl. xxvi. fig. 22.

Off Shark Island, Port Jackson, in black mud, 12 fathoms (*Brazier*).

Fam. Veneridæ.

12. Chione (Circomphalus) lamellata, Lam.

Dredged at "Sow and Pigs" bank, Port Jackson; also Jervis Bay (*Brazier*).

13. Chione (Timoclea) gallinula, Lam.

Twofold Bay (*Brazier*).

14. Callista victoriæ, Woods, Proc. Roy. Soc. Tasmania, 1875, p. 27.

Lake Macquarie and Broken Bay, New South Wales. Also Tasmania, Victoria, and South Australia (*Brazier*).

15. Cytherea sophiæ, Angas, P. Z. S. 1877, p. 176, pl. xxvi. fig. 23.

Cape Solander, Botany Bay; after an easterly gale (*Brazier*).

A small, rounded species, richly painted with orange-chestnut, with the umbones cornelian-red. I have named this pretty little shell after Mrs. Brazier.

16. Tapes flabagella, Desh.

Port Jackson; Lake Macquarie, New South Wales (*Brazier*). Also from Tasmania.

17. Tapes (Cuneus) galactites, Lam.

Jervis Bay (*Brazier*). Common in South Australia.

Fam. Cardiidæ.

18. Cardium (Acanthocardia) multispinosum, Sow.

Live specimens, Macleay river; dead valves at Port Stephens (*Brazier*).

19. Cardium rugosum, Lam.

Port Stephens (*Brazier*).

Lucinacea.

Fam. Lucinidæ.

20. Lucina (Codakia) fibula, Reeve.

Port Jackson and Port Stephens (*Brazier*).

21. Lucina (Cyclas) cumingi, A. Ad. & Angas, P. Z. S. 1863.

Dredged outside Port-Jackson Heads in 20 fathoms (*Brazier*).

22. Lucina (Cyclas) ornata, Reeve.

Port Jackson.

23. Lucina (Codakia) quadrata, Angas, P. Z. S. 1877, p. 176, pl. xxvi. fig. 24.

Shark Island, Port Jackson.

Fam. Laseidæ.

24. Kellia solida, Angas, P. Z. S. 1877, p. 176, pl. xxvi. fig. 25.

"Bottle and Glass" rocks, Vaucluse Bay, Port Jackson (*Brazier*).

Fam. Mytilidæ.

25. Mytilus (Aulacomya) kraussi, Küster; Reeve, Conch. Icon. *Mytilus*, pl. ix. fig. 40.

Variety of *M. nicobaricus*, Chemn.

Cape Banks, Botany Bay (*Brazier*).

PECTINACEA.

Fam. TRIGONIIDÆ.

26. TRIGONIA MARGARITACEA, Lam.

Twofold Bay (*Brazier*).

Fam. ARCIDÆ.

27. PECTUNCULUS GEALEI, Angas, P. Z. S. 1873, pl. xx. fig. 5.

Dredged off Port Macquarie (*Admiral Loring*).

28. LIMOPSIS CANCELLATUS, Reeve.

Outside Port-Jackson Heads, 45 fathoms (*Brazier*).

Fam. NUCULIDÆ.

29. NUCULA PUSILLA, Angas, P. Z. S. 1877, p. 177, pl. xxvi. fig. 26.

Port Jackson, in shell-sand (*Brazier*).

30. NUCULA SIMPLEX, A. Ad. P. Z. S. 1856.

Port Jackson (*F. Strange*).

Fam. LEDIDÆ.

31. LEDA CRASSA, Hinds, P. Z. S. 1843, p. 99.

Dredged off Port-Jackson Heads in 25 fathoms (*Brazier*).

32. LEDA ENSICULA, Angas, P. Z. S. 1877, p. 177, pl. xxvi. fig. 27.

Off Port-Jackson Heads, 45 fathoms (*Brazier*).

A very remarkable shell, with the anterior side produced into a long narrow beak, curving upwards.

Fam. PECTINIDÆ.

33. PECTEN ASPERRIMUS, Lam.

Green Point, Port Jackson, and Twofold Bay (*Brazier*).

34. VOLA FUSCA, Klein.

Port Jackson and Port Stephens (*Brazier*). Also Moreton Bay.

35. AMUSSIUM BALLOTI, Bernardi, Journ. de Conch. 1861.

Neutral Bay, Port Jackson, obtained alive in the trawl in 6 fathoms, sandy mud (*Brazier*). Common in New Caledonia.

Fam. SPONDYLIDÆ.

36. PLICATULA IMBRICATA, Menke.

Port Jackson; Port Stephens (*Brazier*).

Fam. OSTREIDÆ.

37. OSTREA ANGASI, Sow. Conch. Icon. *Ostrea*, pl. xiii. fig. 27.

Neutral Bay, Port Jackson, sandy mud, 6 fathoms.

In my former list (Nov. 28, 1867) I gave this fine species as *Ostrea purpurea* (*Ostrea edulis*, var. *purpurea*, Hanley, Conch.

Miscell. pt. 3), at the same time expressing my opinion that it should be separated as a distinct species under the name of *purpurea*. Since then, Mr. Sowerby has published his Monograph of the genus *Ostrea* in the 'Conchologica Iconica;' and quite agreeing with my views as to the distinct characters of the Australian species from the European one, he has figured the magnificent specimen (18 inches in circumference) brought home by me from Port Jackson, and given the species my name.

7. Notes on some Birds mentioned by Dr. Cabanis and Hr. Reichenow as collected in Papuasia and in the Moluccas, during the Voyage of the 'Gazelle.' By T. Salvadori, C.M.Z.S.

[Received February 19, 1877.]

In the third part of the 'Journal für Ornithologie' for 1876, there is a list of the birds collected during the voyage of the 'Gazelle,' by Cabanis and Reichenow[1]. In that list are mentioned some species of Birds from Papuasia and the Moluccas, on which I wish to make some remarks.

Pratincola caprata (Linn.), New Guinea (!), *l. c.* p. 319.

I am rather surprised to find this species among the birds of New Guinea. *Pratincola caprata* did not appear in the very extensive collections which have been made in New Guinea by D'Albertis, Beccari and Bruijn, neither has it been mentioned by any writer on the birds of New Guinea, or of the Moluccas. Besides, the particular locality where it was collected is not mentioned by Cabanis and Reichenow; also it is to be noticed that there seems to be some mistake as regards the locality mentioned for other species included in the same list. For example, *Ptilopus globifer*, which previously was said to be from New Hanover, is now stated to be from New Ireland. Therefore, when I observe that other birds in the same collection are from Timor, I venture to ask whether the *Pratincola caprata* was not really obtained in Timor, where, as is well known, this bird lives.

Rhipidura fuscescens, Cab. et Reichenow, *l. c.* p. 319, from Segaar Bay, New Guinea, allied to *R. albiscapa* from Australia, is a species which I do not know.

Leucocerca setosa (Quoy et Gaim.), *l. c.* p. 320, from Galeow Strait.

Muscipeta setosa (Quoy et Gaim.) was described from New Ireland; and I doubt whether it may be safely identified with *Rhipidura gularis*, Müll., from New Guinea; the descriptions of the two birds do not agree in several particulars.

[1] Uebersicht der auf der Expedition Sr. Maj. Schiff 'Gazelle' gesammelten Vögel (*l. c.* pp. 319–330).

MONARCHA CORDENSIS, Meyer, New Hanover (!), *l. c.* p. 320.

This species has been described from Mysore; and knowing what a limited range the species from the islands of Geelvink Bay which are representatives of New-Guinea forms have, I am rather inclined to suspect that the bird from New Hanover may belong to a different species.

MELIDIPNUS MEGARHYNCHUS (Gr.), *l. c.* p. 321.

The new genus *Melidipnus* has the same type as my genus *Melilestes*, Ann. Mus. Civ. Gen. vii. p. 950 (1875).

The *Tropidorhynchus gilolensis* (which I take to be the same as *Melitograis striata*, Sund. Meth. Nat. Av. disp. Tent. p. 50), according to me, does not belong to the same genus, but must be left in the distinct genus *Melitograis*, or referred to *Philemon* (restricted).

GRACULA GNATHOPTILA, Cab. et Rchnw., *l. c.* p. 322, New Hanover.

Cabanis and Reichenow say that this species differs from *Gracula kreffti*, Sclat., in having a yellow belly and in the complete absence of the naked skin along the lower edge of the mandible. I doubt whether the above-mentioned characters are sufficient to distinguish the New Hanoverian bird from that of the Solomon Islands. Having been able, through the kindness of my friend Dr. Sclater, to examine the type specimen of his *G. kreffti*, I have found that, although rather discoloured by the spirit of wine in which it has been preserved, that bird also has a yellow belly; and, according to my notion, the naked line along the lower edge of the mandible being much narrower depends on the way in which the bird has been skinned and stuffed. In a very large series of specimens of *G. dumonti* from New Guinea and the Aru Islands there is a great variation in the width of the naked skin along the lower edge of the mandible, some examples having it much narrower than others, according to the way they have been skinned.

I take this opportunity to state that the figure of *Gracula kreffti* (P. Z. S. 1869, pl. ix.) is quite wrongly coloured on the lower part of the back and on the upper tail-coverts, where, instead of yellow, it ought to be perfectly white.

ALCEDO MOLUCCENSIS, Bechst. (*sic*!), *l. c.*, p. 323, New Ireland.

I suppose that "Bechst." is a misprint for "Blyth;" I have already shown that this bird must be called *Alcedo ispidoides*. Less.

RHAMPHOCOCCYX CALORHYNCHUS (Temm.), *l. c.* p. 324, Ceram (!).

Were the specimen or specimens brought home collected in Ceram, or received in Ceram? Till now *R. calorhynchus* was believed to be peculiar to Celebes.

ŒDIRHINUS GLOBIFER, Cab. & Rchnw., *l. c.* p. 326.

Ptilopus (*Œdirhinus*, nov. subgen.) *globifer*, Cab. & Rchnw. Sitzb. Ges. nat. Freunde zu Berlin vom 16. Mai 1876, p. 73.

Have Dr. Cabanis and Reichenow compared the curious bird with *Ptilopus insolitus*, Schleg. Ned. Tijdschr. v. Dierk. i. p. 61, pl. iii. fig. 3? I suppose not, as otherwise they would not have failed to mention the great likeness which there appears to be between their bird and that of Schlegel. *Ptilopus insolitus* also has the base of the upper mandible swollen into a round ball; the colours are very much the same as those of *Œ. globifer*, excepting that it has the smaller and also some of the greater and median wing-coverts and the last remiges, approaching the back, light grey. Schlegel had received his birds as from New Caledonia; but in the Muséum des Pays-Bas, *Columbæ*, p. 16, he has expressed his opinion that perhaps the type specimen of his *Ptilopus insolitus* was nothing else than a monstrous specimen of *Ptilopus humeralis jobiensis*!

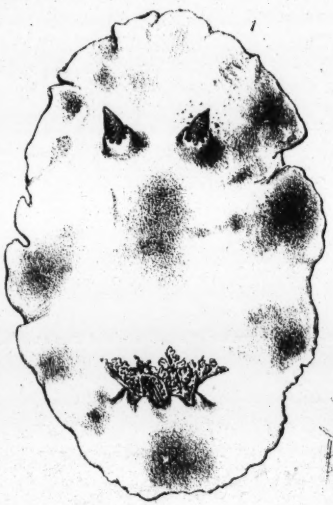
It seems to me very probable that *Œdirhinus globifer* is identical with *Ptilopus insolitus*—a species which I shall have to add to the List of the Pigeons included in the second part of my "Prodromus Ornithologiæ Papuanæ et Moluccarum" (Ann. Mus. Civ. Gen. ix. pp. 194–208).

8. Revision of the Anthobranchiate Nudibranchiate Mollusca, with Descriptions or Notices of forty-one hitherto undescribed Species. By PHINEAS S. ABRAHAM, M.A., B.Sc., F.R.M.S., F.Z.S.

[Received February 20, 1877.]

(Plates XXVII.–XXX.)

Before the time of Cuvier but comparatively little attention had been paid to the naked-gilled Mollusca. Linnæus, in the earlier editions of his 'Systema Naturæ,' alludes to *Tethys*, as a genus of the order *Zoophyta*; in his 10th edition, 1758, the genera *Doris* (with one species) and *Scyllæa* first appear, and together with *Tethys* are included in the 4th order *Molusca*, of his 6th class, *Vermes*. He also diagnoses what we now believe to be *Eolis papillosa*, under the generic name *Limax*. In the 12th edition four species of *Doris* are scantily characterized, viz. *D. verrucosa*, *D. bilamellata*, *D. lævis*, and *D. argo*. The second and fourth have been identified; but of the remaining two we are not certain: *D. verrucosa* may be *D. verrucosa* of Cuvier; and *D. lævis* may be *D. repanda* of Alder and Hancock. Linnæus at first considered that the circumanal branchiæ of *Doris* were oral tentacula; he rectified his mistake, however, in his 12th edition, after the proper homologies of the parts had been pointed out by Bohadsch in 1761. In the 'Fauna Grœnlandica,' published by Otto Fabricius in 1780, the foot of a *Doris* is described







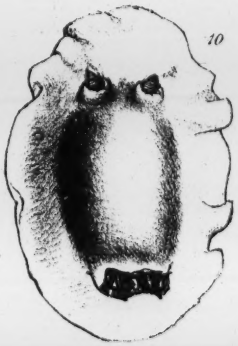


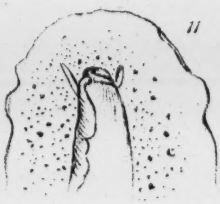










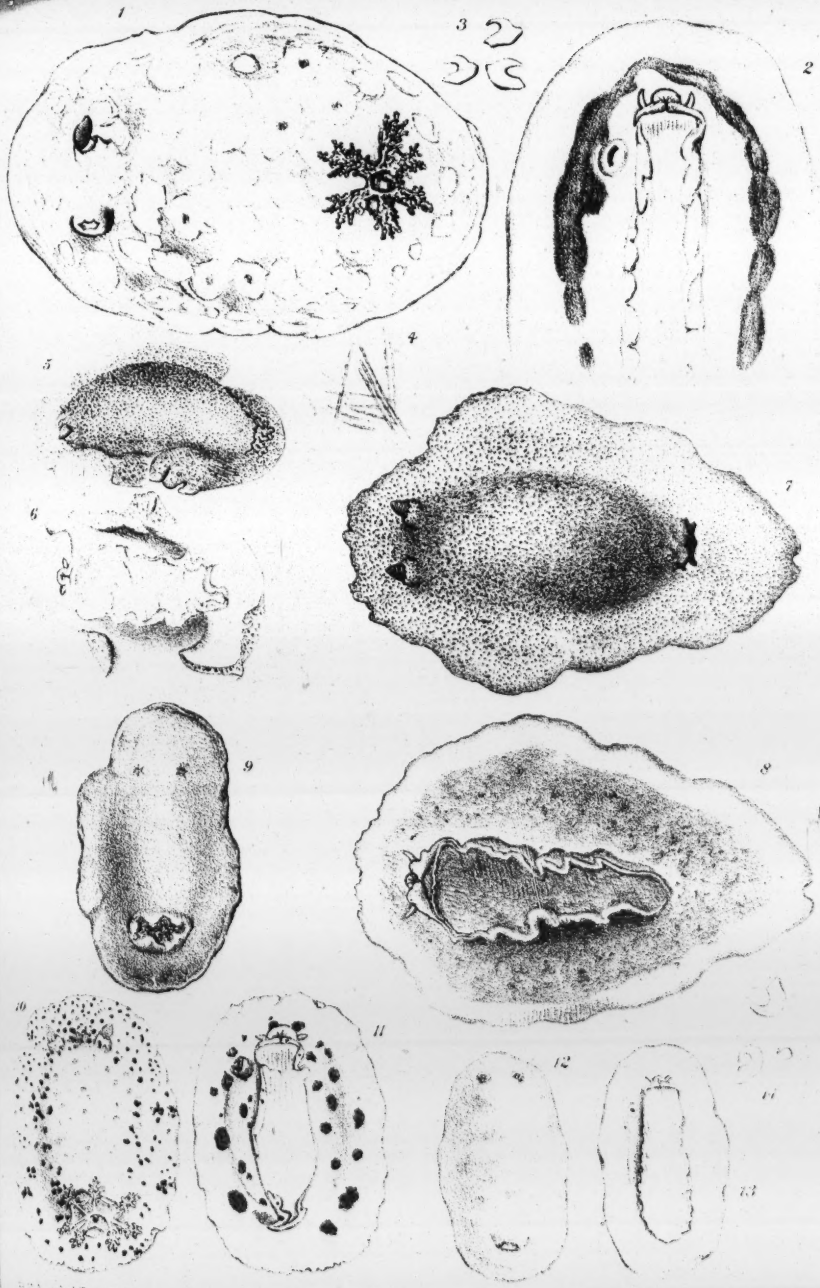


P.Z.S. del. J.Smit. lith.

M & N Hanhart. imp.

NEW NUDIBRANCHIATE MOLLUSCA.





NEW NUDIBRANCHIATE MOLLUSCA

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NEW NUDIBRANCHIATE MOLLUSCA



as "the worm itself," while the upper lamella, which is really the principal part of the body of the animal, is regarded as a kind of protecting house. The number of species of *Doris* was increased to 12 by O. F. Müller in 1776; and subsequently most of them were figured in his 'Zoologica Danica.' Six of the new species, however, do not correspond with Linnæus's genus, and in fact, belong to other sections of the Nudibranchiata. Gmelin followed Müller, and still further enlarged the genus to include 25 species. The genus *Doris*, thus made to be almost synonymous with what we now understand as the "Nudibranchiata," was reduced by Cuvier in the 'Tableau élémentaire d'Histoire Naturelle,' 1798, to its original Linnæan signification, and shown to include but 7 of the previously enumerated species. In the 'Annales du Muséum' for 1804, Cuvier wrote a classical article on *Doris*, in which he brought forward 13 species, giving more or less lengthened descriptions of several of them, and figures of six. He divided the genus into 'Les Doris planes,' and 'Les Doris prismatiques.' In 1814, in his memoir on a new classification of Mollusca, De Blainville proposed the name 'Cyclobranches' (Cyclobranchiata) for his 4th order of "Cephalic Mollusca," to include those "which have the organs of respiration symmetrical, hidden or exposed, and placed in a circle on the posterior portion of the body." Cuvier, in 1817, ignored this, and used the same term for the 7th order of the class Gasteropoda, to embrace the Chitons and Patellas. He has been so very generally followed that it would only create confusion now to employ the name in its original meaning. In the same year Cuvier called the whole of the naked-gilled Mollusks "Nudibranches" (Nudibranchiata); and in 1820 Goldfuss, shortly followed by Férussac, named those with the branchiæ surrounding or near the anus on the medio-dorsal line, "Anthobranches" or "Anthobranchiata," the nomenclature now adopted.

From the commencement of this century, the number of known species has been largely increased by scientific voyagers and by home workers. In 1817 Risso described 6 Mediterranean species in the 'Journal de Physique,' a number that he increased to 10 in his 'Histoire Naturelle de l'Europe Méridionale' of 1826. In a monograph, "Ueber das Molluskengeschlecht Doris," published in the 'Nova Acta Nat. Cur.' in the latter year, Rapp enumerated 27 forms, among which 6 were new; several of them he figured. Rüppell and Leuckart, two years afterwards, described and figured 12 new species in the 'Atlas zu der Reise im nördlichen Afrika.' Ehrenberg, in 1831, described 15 new varieties in his 'Symbolæ Physicæ;' and this naturalist enunciated a somewhat elaborate classification, founded upon differences in the arrangement of the branchial apparatus of the animals before him. His system has not been found to hold good. In the following year, Quoy and Gaimard, in the 'Voyage de l'Astrolabe,' gave drawings and descriptions of 21 species of Doridida, all but three of which were new. They were chiefly from the Malayan, Australian, and Pacific Islands. Other naturalists who have principally increased our knowledge of these Mollusks have been:—D'Orbigny, to whom we owe 12 or 13; Cantraine, who enu-

merated 17 (a few of them new) from the Mediterranean; Philippi, who recorded 23 from Sicily; Lovén, who found 18 (5 new) on the Scandinavian shores; Verany, who described 11 new species, and enumerated 11 others from the Gulf of Genoa, and who afterwards catalogued 23 from the environs of Nice. Kelaart has described 42 from Ceylon; Angas, 21 from New South Wales; Alder and Hancock, 32 from India and Ceylon; Gould, 9 species from Eastern North America, and 14 from the Pacific Isles; Pease, 28 from the same part of the world. Recently Bergh has figured, described, or named about 32 species of Anthobranchiate Nudibranchiata from the Philippine archipelago. In addition, De Blainville, Leach, Gray, Fischer, Mörch, and several other naturalists have more or less studied the group, and have from time to time added species to the list. With the exception of Cuvier, Delle Chiaje, Johnston, Alder, Hancock, Embleton, and Bergh, few observers have examined the anatomy of this section of the order.

Between the years 1845 and 1855, appeared Alder and Hancock's 'Monograph of the British Nudibranchiate Mollusca.' This is by far the most important work that has ever been written on the naked-gilled Mollusca. In it 39 species of our native Anthobranchiata are included, and 29 of them minutely described and beautifully figured. Twenty-two were new or but recently described by the authors; and, for the first time, something like a philosophical classification of the Nudibranchiata was proposed. Upon that arrangement is based, in a great measure, the plan adopted in the present paper.

The Anthobranchiate naked-gilled Mollusks are found all over the globe, frequenting, for the most part, rocky shores between high- and low-water mark. Some, however, have been dredged from comparatively deep water, or have been found on floating seaweed. They appear to be more numerous, larger, and with more brilliant colours in the warmer seas, especially in those of the eastern hemisphere. Some of them have a wonderfully wide "habitat." In the British Museum there are specimens of the common European *Doris tuberculata*, which were obtained from New Zealand and from Vancouver Island. *Lamellidoris bilamellata*, also one of the commonest of North-European Doridide, is found on both coasts of North America; and several other instances might be given. The American forms are, as a rule, few, small, and obscure in colouring. The small, brightly coloured Chromodorides are all inhabitants of warm seas; while the Polycerides have principally been discovered on the colder shores. The Indian and Pacific Oceans seem to be the head quarters of the remarkable tongueless Doridopsidæ; but a few have extended so far north as the Mediterranean.

Order NUDIBRANCHIATA, Cuvier, 1817.

Doris, Müller, 1776.
Dermobranches (*Dermobranchiata*) *à corps nu*, Dumeril, 1806.
Les Tritoniens (*Tritoniacea*), Lamarck, 1819.
Hydrobranches (part of), Lamarck, 1819.
Gymnobranchia, Schweigger, 1820.
Notobranchia (part of), Bronn, 1862.

Opisthobranchiate, hermaphrodite Mollusca, with the branchiæ, if present, more or less exposed on the back or on the sides; without shell when adult.

Suborder I. ANTHOBRANCHIATA, Goldfuss, 1820.

Cyclobranches (*Cyclobranchiata*), De Blainville, 1814.
Pygobranchia, Gray, 1821.
Doridida, Leach, 1820.
Dorides, Férussac, 1821.
Urobranchia, Latreille, 1825.
Doridiæ, Menke, 1828.
Doridæ, D'Orbigny, 1837.
Doridiacea, Philippi, 1853.
Acanthobranchiata, Alder and Hancock, 1855.

The branchiæ more or less surrounding the anus upon the mediodorsal line.

Fam. I. DORIDIDÆ, Ald. & Hanc. 1855.

Doridini, Ehr. 1831.
Doris bombées et planes, Cantr. 1840.
Dorina, Macgillivray, 1843.
Doridinæ, Ald. & Hanc., 1845.
Doridina, Gray, 1847.

Mantle (*nothæum*) large, without marginal appendages; skin generally very spiculose; dorsal tentacles (*rhinophora*) laminate and retractile within cavities.

The Doridida may be classed under two sections or subfamilies:—

§ 1. Those with the oral tentacles free; and with the odontophore broad and bearing numerous spines in each transverse row. (PLATYGLOSSÆ.)
§ 2. Those with the oral tentacles united into an oral veil; and with the odontophore narrow and strap-shaped, and bearing but few spines in each transverse row. (LEPTOGLOSSÆ).

§ 1. PLATYGLOSSÆ.

Genus DORIS, Linnæus, 1758.

Argus, Bohadsch.

Body depressed, or subconvex; integument spiculose; mantle often tuberculate, covering the head and the foot; branchiæ plumose or ramose, united at the base, and retractile with the anus into a common pallial cavity; mouth inferior, with two distinct oral ten-

tacles (rarely absent); odontophore broad, with numerous spines in each transverse row.

The genus is very similarly characterized in the Appendix to Messrs. Alder and Hancock's monograph. In the text of that work, however, "Doris" is made to include *Doris* proper, *Lamellidoris*, and *Acanthodoris* as sections. There can be little doubt that the internal and external distinctions of the three groups are really sound generic differences.

The following subdivisions of the restricted genus *Doris* were proposed by Alder and Hancock;—

"*a*. Dorsal tentacles conical; oral tentacles tubercular; cloak with hard spiculose tubercles. Lingual spines simple, uniform; no central spine. Type *D. tuberculata*, Cuv.

"*b*. Dorsal tentacles conical; oral tentacles tubercular; cloak with soft tubercles. Lingual spines long, linear, obtuse, denticulated; no central spine ..... Type *D. zetlandica*, A. & H.

"*c*. Dorsal tentacles clavate; oral tentacles linear; lingual spines of two forms; no central spine ..... Type *D. johnstoni*, A. & H.

"*d*. Dorsal tentacles linear; oral tentacles angular, flattened. Lingual spines denticulated; a small central spine. Mouth with a spinous collar. Type *D. repanda*, A. & H.

"*e*. Dorsal tentacles conical, partially retractile, and protected by leaf-like appendages; oral tentacles linear or tubercular; branchiæ linear, simply pinnate; cloak with large tubercles. Lingual spines simple, uniform; no central spine. *Glossodoris*, Ehr. ..... *D. verrucosa*, Cuv.

"*f*. Dorsal tentacles conical; oral tentacles leaf-shaped; branchiæ each with several pinnate rays branching from a foot-stalk; cloak very large, flat and coriaceous. Lingual spines? *Actinodoris*, Ehr. *D. cruenta*, Qu. & G.

"*g*.? With only two tentacles; branchiæ in front of anus, not surrounding it. Lingual spines? *Actinocyclus*, Ehr. ..... *A. vetulinus*, Ehr.

"*h*.? Dorsal tentacles truncated; branchiæ small; cloak large, carinated on the back. Lingual spines? *Atagema*, Gray..... *D. carinata*, Qu. & G."

So far as we at present know, perhaps 9 species may be referred to division *a*, one to division *b*, four to *c*, and two to *d*. Division *e* corresponds with the genus "*Doridigitata*," D'Orbigny, or "*Glossodoris*," Gray (*non* Ehrenberg), and includes four species. The group *f*, supposed to be synonymous with "*Actinodoris*," Ehr., can scarcely be maintained; for many of the species which have been referred to it are probably Doridopsidæ, and *D. cruenta*, which Alder and Hancock have taken for the type, undoubtedly belongs to the "*Asteronotus*" group. Division *h* contains but one species. This arrangement gives no place to a large number of Dorides which have the common characters of a depressed coriaceous body, wide and granular mantle, rhinophores clavate and retractile in denticulate-edged sheaths, oral tentacles linear or slightly flattened, branchiæ six, retractile in a cavity protected by six lobular marginal processes, lingual spines simple, uniform, none central—and the type of which is *Asteronotus hemprichii*, Ehr. After using all the above sections, we should still have left some 90 species or so, which either do not fit into any of them, or which have been too scantily characterized for us to determine their position. A great many of the published descriptions of these animals are so meagre and superficial, often

merely the evanescent colours being given, that it is sometimes a matter of doubt whether they belong to the genus at all. Such being the case, no accurate synoptical table of the species can be formed in the present state of our knowledge.

List of Species[1].

1. DORIS HEMPRICHII.

Asteronotus hemprichii, Ehrenberg, Symb. Phys., An. evert. excl. insect. (1831).
Hab. Red Sea (Massowah).

2. D. CRUENTA, Quoy & Gaimard, Voy. de l'Astrol. Zool. ii. p. 260, pl. 18. f. 5–7 (1832).

Actinodoris cruenta, Gray.
Doris (*Argus*) *cruenta*, Mörch.
Hab. New Guinea.

3. D. CRUENTATA.

Asteronotus cruenta, "Alder, MS.," Gray, Fig. Moll. An. iv. t. 226. f. 2 (1850).
Hab. Torres Straits.

4. D. ANGUSTIPES.

Doris (*Argus*) *angustipes*, Mörch, Journ. de Conchyl. 3e ser. iii. p. 32 (1863).
Hab. St. Thomas.

5. D. SOLEA, Cuvier, Ann. du Mus. iv. p. 465, pl. 74. f. 1, 2 (1804).

Doris semelle, De Blainville.
Hab. Mauritius.

6. D. SCABRA, Cuv. *l. c.* p. 466.

Actinodoris scabra, Gray.
Hab. Timor, Tonga, New Guinea.

7. D. FORSTERI, De Blainv. Bull. Sc. Soc. Phil. année 1816, p. 94.
Hab. Atlantic.

8. D. PUNCTATA, Quoy & Gaim. *l. c.* p. 262, pl. 18. f. 3–10.

Actinodoris punctata, Gray.
Hab. New Zealand.

[1] I commenced by placing the species next to each other according to their affinities; but for reasons just alluded to, this cannot always be done; hence, except in some cases, it does not follow in this and in the following lists, that the forms arranged close together are always those most nearly resembling one another.

9. Doris punctifera.

Doris punctata, D'Orbigny, Hist. Nat. des îles Canar. ii. Mollusques, p. 38, pl. 4. f. 1–5 (1857).
Doris orbignyi, H. and A. Adams.
Hab. Teneriffe.

10. D. punctuolata, D'Orb. Voy. dans l'Amér. mérid. v. p. 187, pl. 16. f. 4–6 (1836).
Hab. Valparaiso.

11. D. canariensis, id. Hist. Nat. îles Can. ii. p. 39.
Hab. Teneriffe.

12. D. formosa, Alder and Hancock, Trans. Zool. Soc. v. p. 116, pl. 29. f. 1–3 (1864).
Hab. Madras coast.

13. D. ellioti, id. *l. c.* p. 116, pl. 28. f. 1, 2.
Hab. Coromandel coast.

14. D. striata, Kelaart, Ann. & Mag. Nat. Hist. 3rd ser. iii. p. 203 (1859).
Hab. Madras, Ceylon.

15. D. lockyerana, id. Ann. Nat. Hist. 3rd ser. iv. p. 268 (1859).
Hab. Ceylon.

16. D. pardalis, Ald. and Hanc. *l. c.* p. 117, pl. 28. f. 3.
Hab. Madras.

17. D. concinna, Ald. and Hanc. *l. c.* p. 118, pl. 28. f. 4–6.
Hab. Madras.

18. D. spiraculata, Gould, U.S. Expl. Exp. "Moll. &c." p. 300, pl. 23. f. 395 (1852).
Actinodoris spiraculata, H. and A. Adams.
Hab. Feejee Islands.

19. D. argo, Linnæus, Syst. Nat. 12th ed. p. 1083 (1767).
Argus, Bohadsch, 1761; *Doris rubra*, Risso; *Doris argus*, Rapp.
Hab. Mediterranean.

20. D. peruviana, D'Orb. *l. c.* p. 188, pl. 15. f. 7–9.
Doriopsis peruviana, Bergh.
Hab. Lima.

21. D. maculosa, Cuv. *l. c.* p. 466.
Actinodoris maculosa, Gray.
Hab. Australia; Vanikoro.

22. Doris cœlestis, Kel. Ann. Nat. Hist. 3rd ser. iii. p. 293 (1859).

Hab. Ceylon.

23. D. sanguinea.

Doris (*Asteronotus*) *sanguinea*, Cooper, Proc. Cal. Ac. Nat. Sc. ii. p. 204 (1862).

Hab. W. North America (Sandiego Bay).

24. D. alabastrina.

Doris (*Asteronotus?*) *alabastrina*, id. *l. c.* p. 204.

Hab. W. North America (Sandiego Bay).

25. D. coriacea, sp. nov. (Plate XXVII. figs. 1–4.)

Hab. Seychelles; Sir. C. Hardy's Isles; S. Africa.

26. D. tabulata, sp. nov. (Plate XXVII. fig. 9.)

Hab. ——?

27. D. inframaculata, sp. nov. (Plate XXVII. figs. 5–7.)

Hab. Amboina.

28. D. infranævata, sp. nov. (Plate XXVII. fig. 8.)

Hab. Mediterranean.

29. D. hepatica, sp. nov. (Plate XXVIII. fig. 9.)

Hab. Ricinola.

30. D. mabilla, Bergh (in sched.). (Plate XXVIII. figs. 1–4.)

Hab. Seychelles, Samoa.

31. Doris arrogans, Bergh, figured in Semper's Reise im Arch. phil. Bd. ii. Heft 9, t. 41. f. 2 (1875).

Hab. Philippine seas.

32. D. subtumida, sp. nov. (Plate XXVII. figs. 10, 11.)

Hab. Mediterranean.

33. D. speciosa, sp. nov. (Plate XXVIII. figs. 10, 11.)

Hab. Amboina.

34. D. constantia, Kel. *l. c.* p. 298.

Hab. Ceylon.

35. D. viperina, id. *l. c.* p. 299.

Hab. Ceylon.

36. D. stragulata, sp. nov. (Plate XXVIII. figs. 7, 8.)

Hab. —— ?

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37. D. tuberculata, Cuv. *l. c.* p. 469, pl. 74. f. 5.

Doris argo, Pennant; *Doris britannica*, Leach; *Doris montagui*,

Leach; *D. pseudo-argus*, Rapp; *Doris argus*, Stark; *Doris mera*, Ald. & Hanc.; *Dendrodoris tuberculata*, Gray; *Actinocyclus tuberculatus*, H. & A. Adams.

Hab. Northern European coasts; Western North America (Victoria); New Zealand.

38. DORIS FLAVIPES, Leuckart, Brev. An. quor. Descr. p. 14 (1828).

Hab. Mediterranean.

39. D. MONTEREYENSIS, Cooper, *l. c.* p. 205.

Hab. Californian coast.

40. D. FONTAINII, D'Orb. *l. c.* p. 189, pl. 15. f. 1–3.

Doriopsis fontainii, Bergh.

Hab. Chilian coast.

41. D. FLAMMEA, Ald. & Hanc. Mon. Br. Nud. Moll. p. 41, and pt. i. fam. 1, pl. 4 (1844).

Doris argus, Forbes; ? *Doris rubra*, Risso; ? *Doris argus*, Bouchard-Chantereux.

Hab. British and ? French coasts.

42. D. CRUCIS.

Doris (*Dendrodoris*) *crucis*, "Oersted in sched.," Mörch, *l.c.* p. 33.

Hab. St. Thomas; Santa Cruz.

43. D. CRYPTOSTOMATA, Mörch.

Doris tuberculata, "Cuv.," Andouin in Savigny's Descr. de l'Égypte (1809).

Hab. Egypt.

44. D. VESTITA, sp. nov. (Plate XXVIII. figs. 5, 6.)

Hab. Straits of Magellan.

45. D. MURREA, sp. nov. (Plate XXVIII. figs. 12–14.)

Hab. Mauritius.

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46. D. ZETLANDICA, Ald. & Hanc. *l. c.* p. 42, and Append. p. i. (1855).

Hab. Shetland Isles; Norway.

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47. D. MILLEGRANA, id. *l. c.* p. 41, and Append. p. i.

Hab. South coast of England; St. Vincent.

48. D. JOHNSTONI, id.

Doris obvelata, Johnst. Ann. & Mag. Nat. Hist. i. p. 52 (1838).

Hab. British Isles.

49. Doris coccinea, "Montagu, MS.," Forbes, Rep. Moll. and Rad. of Ægean Sea, in Brit.-Assoc. Rep. for 1843, p. 133.

Doris rubra, D'Orb.
Hab. South coast of England; France; Ægean Sea.

50. D. testudinaria, Risso, Journ. de Phys. lxxxvii. p. 370 (1818).

Doris planata, Ald. & Hanc.
Hab. Mediterranean and N. Europe.

51. D. granulosa, sp. nov. (Plate XXIX. figs. 1–3.)
Hab. New Zealand.

52. D. longula, sp. nov. (Plate XXIX. figs. 4, 5.)
Hab. New Zealand.

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53. D. repanda, Ald. & Hanc. Ann. & Mag. Nat. Hist. ix. p. 32 (1842); figured, Monograph &c. Fam. 1, pl. 6.

Doris lævis, Fleming; *Doris obvelata*, Lov.; *Doris planulata*, Stimpson; ? *Doris lævis*, Linnæus; ? *Doris bilamellata*, Gravenhorst; ? *Doris marginata*, Montagu.
Hab. N. Europe; Eastern N. America (Grand Manan).

54. D. glabra, Friele & Hansen, Bidr. til Kundsk. om de Norske Nudibr. p. 2 (1875).

Hab. Norway.

55. D. raripilosa, sp. nov. (Plate XXIX. figs. 29, 30.)
Hab. —— ?

56. D. muscula, sp. nov. (Plate XXIX. figs. 6, 7.)
Hab. New Zealand.

57. D. analampulla, sp. nov. (Plate XXIX. figs. 8–10.)
Hab. Australia.

58. D. cucullata, sp. nov. (Plate XXIX. figs. 11, 12.)
Hab. —— ?

59. D. labifera, sp. nov. (Plate XXIX. figs. 13, 14.)
Hab. Seychelle Islands.

60. D. lanuginata, sp. nov. (Plate XXIX. figs. 15–17.)
Hab. New Zealand.

61. D. collatata, sp. nov. (Plate XXIX. figs. 25, 26.)
Hab. Port Essington.

62. D. pustulata, sp. nov. (Plate XXIX. figs. 18, 19.)
Hab. Australia.

63. Doris pustulosa, Cantraine, Malac. Méd. et lit. p. 60, pl. A. f. 5 (1840).
Hab. Mediterranean Sea (Naples).

64. D. sordida, Rüppell & Leuckart, Atl. zu der Reise im nördl. Afrika, N. wirb. Th. des roth. Meers, p. 34, t. 10. f. 3 (1828).
Hab. Red Sea (Massowah).

65. D. sordidata.
Doris sordida[1], Quoy & Gaimard, Voy. de l'Astr. Zool. ii. p. 266, pl. 19. figs. 12, 13 (1832).
Hab. Mauritius.

66. D. schembrii, Verany, Cat. d. An. d. g. d. Genov. &c. pp. 17 & 21 (1846).
Hab. Gulf of Genoa; Nice.

67. D. porri, Ver. *l. c.* pp. 17 & 22.
Hab. Gulf of Genoa; Nice.

68. D. villosa, Ald. & Hanc. Trans. Zool. Soc. v. p. 119, pl. 33. f. 1 (1866).
Hab. Coast of Madras.

69. D. excavata, Pease, Proc. Zool. Soc. 1860, p. 26.
Hab. Sandwich Islands.

70. D. echinata, id. *l. c.* p. 27.
Hab. Sandwich Islands.

71. D. scabriuscula, id. *l. c.* p. 27.
Hab. Sandwich Islands.

72. D. pilosa, id. *l. c.* p. 27.
Hab. Sandwich Islands.

73. D. grandifloriger.
D. grandiflora, Pease, *l. c.* p. 30.
Hab. Sandwich Islands.

74. D. setosa, Pease, *l. c.* p. 26.
Hab. Sandwich Islands.

75. D. venosa, Quoy & Gaim. *l. c.* p. 274, pl. 20. figs. 15, 16.
Hab. Flacq.

76. D. areoligera.
D. areolata[2], Ald. & Hanc. *l. c.* p. 119, pl. 30. figs. 1 & 3.
Hab. Coast of Madras.

[1] It is doubtful whether this be not the same as Rüppell & Leuckart's species.

[2] According to Alder and Hancock, this resembles *D. spongiosa*, Kel. The name was previously employed by Stimpson.

77. Doris rusticata, Ald. & Hanc. *l. c.* p. 120, pl. 30. figs. 4, 5.
Hab. Coast of Madras.

78. D. castanea, Kelaart, Ann. Nat. Hist. 3rd ser. iii. p. 303(1859)
Hab. Ceylon and coast of Madras.

79. D. nivea, Kel. *l. c.* p. 296 (1859).
Hab. Coast of Ceylon.

80. D. marmorata, id. *l. c.* p. 296.
Hab. Coast of Ceylon.

81. D. vermicelli, Gould, Unit.-St. Expl. Exp. xii. p. 293, pl. 22. fig. 387 (1852).
Hab. Valparaiso.

82. D. luteola, "Couthouy, MS.," Gould, *l. c.* p. 295, pl. 22. fig. 389.
Hab. Eastern N. America (Burnt Island, Orange Harbour).

83. D. plumulata, "Couthouy, MS.," Gould, *l. c.* p. 294, pl. 22. fig. 388.
Hab. E. coast of N. America (Orange Harbour).

84. D. variolata, D'Orb. Voy. d. l'Am. Mér. v. p. 186, pl. 16. figs. 1–3 (1836).
Hab. Valparaiso.

85. D. chilensis, id. *l. c.* p.
Hab. Valparaiso.

86. D. humberti, Kel. *l. c.* vol. iv. p. 268 (1859).
Hab. Ceylon.

87. D. reticulata, "Schultz," Philippi, En. Moll. Sic. i. p. 105 (1836).
Hab. Sicily.

88. D. petechialis, Gould, *l. c.* p. 296, pl. 22. f. 395.
Hab. Honolulu.

89. D. papillosa, Kel. *l. c.* iii. p. 297.
Hab. Ceylon.

90. D. rufopunctata, id. *l. c.* p. 297.
Hab. Ceylon.

91. D. ossiosa, id. *l. c.* p. 298.
Hab. Ceylon and Madras coast.

92. Doris tristis, Ald. & Hanc. *l. c.* p. 121, pl. 30. f. 6, 7.
Hab. Coast of Madras.

93. D. exanthemata, Kel. *l. c.* p. 300.
Hab. Ceylon.

94. D. variabilis, id. *l. c.* p. 300.
Hab. Ceylon.

95. D. leopardi, id. *l. c.* p. 294.
Hab. Ceylon.

96. D. sublutea.
D. luteola, id. *l. c.* p. 299.
Hab. Ceylon.

97. D. intecta, id. *l. c.* p. 302.
Hab. Ceylon.

98. D. corrugata, id. *l. c.* p. 303.
Hab. Ceylon.

99. D. bellicosa, id. *l. c.* p. 303.
Hab. Ceylon.

100. D. picta, id. *l. c.* p. 303.
Hab. Ceylon.

101. D. fragilis, Ald. & Hanc. *l. c.* p. 118, pl. 28. f. 7, 8.
Hab. Madras coast.

102. D. lanuginosa, Kel. *l. c.* p. 302.
Hab. Ceylon.

103. D. funebris, Kel. *l. c.* p. 293, and Ald. & Hanc. *l. c.* pl. 30. f. 9, 10.
Hab. Ceylon and Coromandel coast.

104. D. marmorata, Risso, Journ. de Phys. lxxxvii. p. 369 (1818).
Hab. Mediterranean (Nice).

105. D. lutea, id. *l. c.* p. 369.
Hab. Mediterranean (Nice).

106. D. rissæ, Verany, *l. c.* pp. 16 & 21 (1846).
Hab. Gulf of Genoa; near Nice.

107. D. sismondæ, id. *l. c.* pp. 16 & 21.
Hab. Gulf of Genoa; near Nice.

108. Doris hispida, D'Orb. *l. c.* p. 188, pl. 15. f. 4–6.
Hab. Valparaiso.

109. D. tomentosa, Cuv. *l. c.* p. 470.
Hab. Valparaiso.

110. D. tomentifera.
D. tomentosa, Philippi, En. Moll. Sic. i. p. 104 (1836), ii. t. 19. f. 9.
Hab. Mediterranean.

111. D. albopunctata, Cooper, *l. c.* iii. p. 58 (1863).
Hab. Mediterranean.

112. D. pantherina, Angas, Journ. de Conch. xi. p. 47, pl. 4. f. 5 (1864).
Hab. New South Wales.

113. D. varia.
D. variabilis, id. *l. c.* p. 44, pl. 4. f. 1.
Hab. New South Wales, Port Jackson.

114. D. arbutus, id. *l. c.* p. 47, pl. 4. f. 4.
Hab. New South Wales.

115. D. aspersa, Gould, *l. c.* p. 304, pl. 25. f. 399.
Hab. Paumotu Islands.

116. D. smaragdina, id. *l. c.* p. 296, pl. 22. f. 390.
Hab. Paumotu Islands.

117. D. schmeltziana, Garrett; Bergh, Journ. des Mus. Godeff. Heft viii. p. 96, t. 8. f. 34–37.
Hab. Paumotu Islands.

118. D. villosa, Pease, Am. Journ. Conch. vii. p. 11, pl. 3. f. 1 (1872).
Hab. Huaheine.

119. D. cinerosa, id. *l. c.* p. 13, pl. 5. f. 1.
Hab. Huaheine.

120. D. nubilosa, id. *l. c.* p. 13, pl. 6. f. 1.
Hab. Huaheine.

121. D. brunnea, Bergh, figured in Semper's Reise im Arch. philipp. Bd. ii. Heft ix. Taf. 41. f. 4 (1875).
Hab. Philippine sea (?).

122. D. carina.
D. carinata, Ald. & Hanc. *l. c.* p. 122, pl. 29. f. 5, 6.
Hab. Coast of Madras.

123. Doris gibberosa, Stimpson, Proc. Ac. of Nat. Sc. Philad. 1855, p. 379.

Hab. China.

124. D. olivacea, id. *l. c.* p. 380.

Hab. Loo Choo.

125. D. rogersii, id. *l. c.* p. 380.

Hab. Kikaisima.

126. D. areolata, id. *l. c.* p. 380.

Hab. Boninsima.

127. D. indurata, id. *l. c.* p. 380.

Hab. China.

128. D. latens, id. *l. c.* p. 380.

Hab. Loo Choo.

129. D. apiculata, Ald. & Hanc. *l. c.* p. 122, pl. 30. f. 8.

Hab. Coast of Madras.

130. D. incii, "Alder, MSS.," Gray, Fig. Moll. An. iv. p. 103, t. 226. f. 1.

Hab. Torres Straits.

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131. D. verrucosa, Cuv. *l. c.* p. 467, pl. 75. f. 4–7.

Doridigitata verrucosa, D'Orb.; *Glossodoris verrucosa*, Gray.

Hab. Mauritius; the Mediterranean.

132. D. bertheloti.

Doridigitata bertheloti, D'Orb. Hist. Nat. des îles Canar. ii. "Moll." p. 40, pl. 4. f. 5–8 (1837); *Glossodoris bertheloti*, Gray.

Hab. Canary Islands.

133. D. d'orbignyi.

Glossodoris d'orbignyi, "D'Orb." Gray, *l. c.* p. 102, t. 216. f. 2 (1850).

Hab. Canary Islands.

134. D. biscayensis, Fischer, Journ. de Conch. xx. p. 6 (1872).

Hab. Coast of France (Gironde).

135. D. seposita, id. *l. c.* p. 8.

Hab. Coast of France (Gironde).

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136. Doris carinata, Quoy & Gaim. *l. c.* p. 254, pl. 16. f. 10–14.
Atagema carinata, Gray.
Hab. New Zealand.

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137. D. prætenera, sp. nov. (Plate XXX. figs. 10–12.)
Hab. New South Wales.

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138. D. mollipustulata, sp. nov. (Plate XXX. figs. 13, 14.)
Hab. ——?

139. D. peculiaris, sp. nov. (Plate XXX. figs. 15–17.)
Hab. South Australia (Port Lincoln).

140. D. ariponensis, Kel. *l. c.* p. 268.
Hab. Ceylon.

141. D. pellucida, Risso, Hist. Nat. de l'Eur. Mér. iv. p. 33 (1826).
Hab. Mediterranean.

142. D. guttata[1], id. *l. c.* p. 33.
Hab. Mediterranean.

143. D. grandiflora, Rapp, *l. c.* p. 520, pl. 27. f. 5.
Dendrodoris grandiflora, Gray; *Actinocyclus grandiflora*, Adams.
Hab. Mediterranean.

144. D. setigera, Rapp, *l. c.* p. 521, pl. 26. f. 8.
D. rappii, Cantr.; *Dendrodoris setigera*, Gray.
Actinocyclus setiger, Adams.
Hab. Mediterranean.

145. D. fumata, Rüpp. & Leuck. *l. c.* p. 29, t. 8. f. 2.
Hab. Red Sea.

146. D. "argus, n. sp.," Mörch, Vid. Medd. for 1871, p. 25.
Hab. Danish Seas.

147. D. papillata, Pease, Proc. Zool. Soc. 1860, p. 30.
Hab. Sandwich Islands.

148. D. nucleola, id. *l. c.* p. 29.
Hab. Sandwich Islands.

149. D.? wellingtonensis, sp. nov. (Plate XXIX. figs. 27, 28.)
Hab. New Zealand.

150. D ? delicata, sp. nov. (Plate XXX. figs. 20–22.)
Hab. Chilian coast (Chiloe).

[1] Philippi considers that this and the ensuing two species may be varieties of *D. limbata*, in which case they must be Doridopsidæ.

151. Doris? cerebralis, Gould, *l. c.* p. 298, pl. 23. f. 393.
Hab. Feejee Islands.

152. D.? lilacina, id. *l. c.* p. 297, pl. 22. f. 392.
Hab. Honolulu, Oahu.

153. D? chrysoderma, Angas, *l. c.* xii. p. 46, pl. 4. f. 3.
Hab. Port Jackson.

154. D.? ornata.
D. (*Dendrodoris*) *ornata*, Ehr. *l. c.*
Hab. Red Sea.

155. D.? fragilis.
Actinocyclus (?) *fragilis*, id. *l. c.*
Hab. Red Sea.

156. D.? erinacea.
Goniodoris erinaceus, Crosse, Journ. de Conch. xii. p. 57, pl. 5. f. 5 (1864); *Chromodoris erinaceus*, Bgh.
Hab. Port Jackson.

157. D.? reticulosa.
Goniobranchus reticulata, Pease, Am. Journ. Conch. ii. p. 205, pl. 14. f. 1 (1866).
Hab. Pacific Islands.

Genus Angasiella, Crosse, 1864.

"Body elongate, rounded in front, attenuated and produced into a point behind; mantle everywhere covering the head and the foot; dorsal tentacles 2; subclavate; branchiæ plumose, few, and placed before the anus, a little behind the middle of the back." (*Crosse.*)

As M. Crosse has told us nothing about the retractility of the branchiæ or the condition of the oral tentacles, odontophore &c., we cannot be certain of the position of this genus.

1. Angasiella Edwardsi, Crosse, Journ. de Conchyl. xii. p. 49, pl. 4. f. 9.
Hab. Port Jackson.

Genus Kentrodoris, Bergh, 1876.

"Mantle broad, soft, with the upper side everywhere minutely granular; rhinophores retractile; tentacles conical; branchiæ retractile, the plumes tripinnate; podarium broad, the margin in front deeply grooved, with the upper lip veliform and deeply emarginate; rounded behind; no buccal armature; no median tooth, the lateral ones uncinate. Penis armed with a spine." (*Bergh.*)

1. K. rubescens, Bgh.; Semper, Reise in Arch. 2te Bd. Heft x. 1876, p. 413, T. 33. f. 8, T. 49. f. 14–19, T. 50. f. 1–8.
Hab. Mare Palaense (Aibukit).

2. KENTRODORIS GIGAS, Bgh. *l. c.* p. 419, T. 50. f. 9–23, T. 51. f. 1–5.

Hab. Philippine sea.

3. K. ANNULIGERA, Bgh. *l. c.* p. 423, T. 41, f. 1, T. 52. f. 3–16.

Hab. Philippine sea.

Genus CHROMODORIS, Ald. & Hanc. 1855.

Doriprismatica, O'Orbigny, 1837 (part of).
Goniodoris, Gray, 1850 (part of).
Goniobranchus, Pease, 1866.
Hemidoris[1], Stimpson, 1855.

Body elongate, subquadrate; mantle narrow, covering the head, but not the extremity of the foot; generally smooth, and marked with bright colours in stripes or spots; oral tentacles conical or tubercular. Branchiæ linear, usually pinnate, retractile in a common cavity. Odontophore broad, with numerous transverse rows of many close-set plates, each bearing two large spines, one in front of the other, the posterior one bearing denticulations; no central plate; a buccal collar, formed of two broad plates, bearing close minute bifid spines.

List of Species[2].

1. C. ZEBRINA, Ald. & Hanc. Trans. Zool. Soc. v. p. 123, pl. 29. f. 7 (1861).

Hab. Coast of Madras.

2. C. ELISABETHINA, Bergh, Journ. des Mus. Godeff. Heft viii. p. 73 (1875), and in Semper's Riese im Arch. phil. Bd. ii. Heft x. T. 21. f. 6–15, & T. 53. f. 58.

Hab. Philippine seas.

3. C. ANNÆ, Bgh. *l. c.* p. 73; fig. Semper, *l. c.* T. 51. f. 22, 23.

Hab. Philippine seas.

4. C. STRIATELLA, id. *l. c.* p. 73; fig. Semper, *l. c.* T. 51. f. 24, 25.

Hab. Philippine seas.

5. C. GLORIOSA, id. *l. c.* Heft vi. T. 1. f. 6–9 (1874).

Hab. Tahiti.

6. C. SCURRA, id. *l. c.* Heft vi. T. 1. f. 10–13; fig. Semper, *l. c.* T. 51. f. 26–31.

Hab. Tahiti.

7. C. HISTRIO, id. *l. c.* Heft viii. p. 73.

Hab. Pacific Ocean.

8. C. LUXURIOSA, id. *l. c.* p. 73.

Hab. Pacific Ocean.

[1] The only characters given are "mantle adnate behind; the rest as in *Doris*." The description of the typical species, *H. cærulcata*, would apply to a *Chromodoris*.

[2] In a recent list by M. Bergh, 73 forms are included.

9. CHROMODORIS LEMNISCATA, Bgh.

D. lemniscata, Quoy & Gaim. Voy. de l'Astr. Zool. ii. p. 268, pl. 19. f. 8, 11 (1832).
Goniodoris lemniscata, Gray; *Doriprismatica lemniscata*, H. & A. Adams.
Hab. Mauritius.

10. C. LINEATA.

D. lineata, Souleyet, Voy. de la Bonite, Zool. ii. p. 453, pl. 25. f. 5–9 (1852); *Goniodoris lineata*, Gray.
Doriprismatica lineata, Adams.
Hab. Sandwich Islands.

11. C. MAGNIFICA, Bergh.

D. magnifica, Quoy & Gaim. *l. c.* p. 270, pl. 28. f. 1–4.
Goniodoris magnifica, Gray[1].
Doriprismatica magnifica, Adams.
Hab. New Guinea.

12. C. WHITEI, Bgh.

Goniodoris whitei, Adams & Reeve, Zool. of Samarang, Moll. p. 68, pl. 19. f. 6 (1848).
Doriprismatica whitei, H. & A. Adams.
Hab. China seas.

13. C. PICTURATA, Bgh.

Goniodoris picturata, Mörch, Journ. de Conch. xi. p. 35 (1863).
Hab. St. Thomas.

14. C. TRILINEATA, Bgh.

G. trilineata, Ad. & Reeve, *l. c.* p. 68, pl. 17. f. 4, 4 a.
D. trilineata, H. &. A. Adams.
Hab. China seas.

15. C. QUADRICOLOR, Bgh.

D. quadricolor, Rüpp. & Leuck. *l. c.* p. 31, t. ix. f. 2.
Hab. Red Sea.

16. C. VILLAFRANCA, Bgh.

D. villafranca, Risso, Journ. de Phys. lxxxvii. p. 470 (1818).
D. pulcherrima, Cantraine; *D. villafranca*, Philippi; *Doriprismatica villafranca*, D'Orb.; *Goniodoris villafranca* and *Goniodoris pulcherrima*, Gray.
Hab. Mediterranean.

17. C. GRACILIS, Bgh.

D. gracilis, Delle Chiaje, Mem. sulla Storia &c., ed. 2, p. 76, tav. 104. f. 22, 23.
Hab. Mediterranean.

[1] In M. E. Gray's 'Figures,' t. 67. f. 17, is given a drawing of a *Chromodoris*, called "*D. magnifica*, Banks, Icon. Ined. 25, Endeavour River," which may be the same animal.

18. CHROMODORIS CÆRULEA, Bgh.

D. cærulea, Risso, *l. c.* p. 370.
D. gracilis, Rapp; *D. tricolor*, Cantr.; *Gon. cærulea*, Gray; *Dorip. cærulea*, H. & A. Adams.
Hab. Mediterranean.

19. C. DECORA, Pease.

D. decora, Pease, Proc. Zool. Soc. 1860, p. 29.
Hab. Sandwich Islands.

20. C. MARGINATA, Pease.

D. marginata, Pease, *l. c.* p. 30.
Hab. Sandwich Islands.

21. C. LINEOLATA, Bgh.

D. lineolata, Van Hass. Bull. Sc. Nat. iii. p. 238 (1824).
Hab. Java.

22. C. ALBA, Bgh.

D. alba, Van Hass. *l. c.* p. 238.
Hab. Indian Ocean.

23. C. DORSALIS, Bgh.

D. dorsalis, Gould, Un.-St. Expl. Exp., Moll. &c. p. 304, pl. 25. f. 400 (1852).
Doripr. dorsalis, H. & A. Ad.
Hab. Society Islands (Eimeo).

24. C. RUMINATA, Bgh. *l. c.* p. 75; figured in Semper, *l. c.* T. 51. f. 32, 33, and T. 53. f. 5–12.

Hab. Philippine Islands.

25. C. SEMPERI, id. *l. c.* p. 75; figured in Semper, *l. c.* T. 51. f. 34, & T. 52. f. 1, 2, & T. 53. f. 13, 14.

Hab. Philippine Islands.

26. C. PAUPERA, id. *l. c.* p. 75; figured in Semper, *l. c.* T. 53. f. 15–27.

Hab. Philippine Islands.

27. C. VIRGINEA, id. *l. c.* p. 75.

Hab. Philippine Islands.

28. C. ALBESCENS, id. *l. c.* p. 75.

D. albescens, "Schultz," Phil. En. Moll. Sic. i. p. 105 (1836), and figured ii. t. 19. f. 7; *Gon. albescens*, Gray; *Doriprism. albescens*, H. & A. Ad.
Hab. Mediterranean (Sicily).

29. CHROMODORIS OBSOLETA, Bgh.

D. obsoleta, Rüpp. & Leuck. *l. c.* p. 31, t. 9. f. 3.
Goniodoris obsoleta, Gray ; *Doriprismatica obsoleta*, H. & A. Ad.
Hab. Red Sea (Tor).

30. C. TINCTORIA, Bgh.

D. tinctoria, Rüpp. & Leuck. *l. c.* p. 32, t. 9. f. 4.
Gon. tinctoria, Gray ; *Doripr. tinctoria*, H. & A. Ad.
Hab. Red Sea (Tor).

31. C. PULCHELLA, Bgh.

D. pulchella, Rüpp. & Leuck. *l. c.* p. 32, t. 9. f. 5.
Gon. pulchella, Gray ; *Doripr. pulchella*, H. & A. Ad.
Hab. Red Sea (Tor).

32. C. PALLIDA, Bgh.

D. pallida, Rüpp. & Leuck. *l. c.* p. 33, t. 10. f. 1.
Gon. pallida, Gray ; *Doripr. pallida*, H. & A. Ad.
Hab. Red Sea (Tor).

33. C. VARIEGATA, Pease, Am. Journ. Conch. vii. p. 15, pl. 7. f. 1 (1871).

Hab. Tahiti.

34. C. TRIONI, Bgh.

Goniodoris trioni, Garrett, Proc. Ac. Nat. Hist. Phil. p. 232, pl. 4 (1873).
Hab. Society Isles.

35. C. PUSTULANS, Bgh. *l. c.* p. 75.

Hab. Philippine seas.

36. C. RUFOMACULATA, Pease, *l. c.* p. 17, pl. 8. f. 1.

Hab. Huaheine.

37. C. ELEGANTULA, Bgh.

D. elegantula, Phil. En. Moll. Sic. ii. p. 80, t. 19. f. 8 (1844).
Gon. elegantula, Gray ; *Doripr. elegantula*, H. & A. Ad.
Hab. Mediterranean (Sicily).

38. C. SCACCHI, Bgh.

D. scacchi, Delle Chiaje, *l. c.* T. 104. f. 13, 14, 15.
Hab. Mediterranean.

39. C. SIMPLEX, Pease, *l. c.* p. 17, pl. 8. f. 2.

Hab. Maiao.

40. C. ALBOMACULATA, Bgh.

Goniobranchus albomaculatus, Pease, *l. c.* ii. p. 204 (1866), & Am. J. Conch. vi. pl. 20. f. 2.
Hab. Pacific islands.

41. CHROMODORIS ALBONOTATA, Bgh. *l. c.* p. 76.
Hab. Pacific Ocean.

42. C. INORNATA, Pease, *l. c.* vii. p. 18, pl. 8. f. 3 (1871).
Hab. Huaheine.

43. C. LENTIGINOSA, Pease, *l. c.* p. 18, pl. 9. f. 1.
Hab. Pacific (Huaheine).

44. C. VARIANS, Pease, *l. c.* p. 19, pl. 9. f. 2.
Hab. Pacific (Huaheine, Maiao).

45. C. PULCHRA, Bgh.
D. pulchra, Pease, Proc. Zool. Soc. 1861, p. 247.
Goniobranchus pulchra, id.
Hab. Pacific Islands.

46. C. VIBRATA, Bgh.
D. vibrata, Pease, Proc. Zool. Soc. 1860, p. 28.
Goniobranchus vibrata, id.
Hab. Sandwich Islands.

47. C. PROPINQUATA, Bgh.
D. propinquata, Pease, *l. c.* p. 28.
Goniobranchus propinquata, id.
Hab. Sandwich Islands.

48. C. PICTA, Bgh.
D. picta, Pease, *l. c.* p. 29.
Goniobranchus picta, id.
Hab. Sandwich Islands.

49. C. PURPUREA, Bgh.
D. purpurea, "Risso,"[1] Guérin, Mag. de Zool. 1re année, "Moll." p. 17, pl. 17. f. 1–4 (1831).
Goniodoris purpurea, Gray; *Doriprismatica purpurea*, H. & A. Ad.
Hab. Mediterranean (Villafranca).

50. C. BENNETTI, Bgh.
Goniodoris bennetti, Angas, *l. c.* p. 51, pl. 4. f. 10.
Hab. New South Wales (Port Jackson).

51. C. LORINGI, Bgh.
Goniodoris loringi, Angas, *l. c.* p. 52, pl. 4. f. 11.
Hab. Port Jackson.

52. C. MARIEI, Bgh.
Goniodoris mariei, Crosse, Journ. de Conch. xx. pp. 77 & 153, pl. 7. f. 5 (1872).
Hab. New Caledonia, Noumea.

[1] Called "*D. purpurea*, Laurillard," on the plate.

53. CHROMODORIS SPLENDIDA, Bgh.

Goniodoris splendida, Angas, *l. c.* p. 55, pl. 5. f. 2.
Hab. Port Jackson.

54. C. DAPHNE, Bgh.

Goniodoris daphne, Angas, *l. c.* p. 54, pl. 5. f. 3.
Hab. New South Wales (Wooloomooloo Bay).

55. C. FESTIVA, Bgh.

Goniodoris festiva, Angas, *l. c.* p. 53, pl. 4. f. 12.
Hab. New South Wales (Vaucluse Bay).

56. C. MONTROUZIERI.

Goniodoris montrouzieri, Crosse, Journ. de Conch. 3rd ser. xv. p. 311, pl. 12. f. 4 (1876).
Hab. Noumea, New Caledonia.

57. C. VERRIERI.

Goniodoris verrieri, id. *l. c.* p. 313, pl. 12. f. 5.
Hab. Noumea, New Caledonia.

58. C. LAMBERTI.

Goniodoris lamberti, id. *l. c.* p. 314, pl. 12. f. 6.
Hab. Noumea, New Caledonia.

59. C. PETITI.

Goniodoris petiti, id. *l. c.* p. 315, pl. 12. f. 7.
Hab. Noumea, New Caledonia.

60. C. SOUVERBIEI.

Goniodoris souverbiei, id. *l. c.* p. 316, pl. 12, f. 8.
Hab. Noumea, New Caledonia.

61. C. ALBOPUSTULOSA, Bgh.

Doris albopustulosa, Pease, Proc. Zool. Soc. 1860, p. 30.
Hab. Sandwich Islands.

62. C. PALLENS, Bgh.[1]

Doris pallens, Rapp, *l. c.* p. 522, t. 27. f. 9.
Hab. Mediterranean.

63. C. CROSSEI, Bgh.

Goniodoris crossei, Angas, *l. c.* p. 54, pl. 5. f. 1.
Hab. Port Jackson.

64. C.? PUSILLA, Bgh. *l. c.* Heft vi. t. i. f. 19, 20 (1874).

Hab. Pacific Ocean.

[1] Very scantily characterized by Rapp; Philippi thinks it possible that this and *D. elegantula* are varieties of the same species.

65. CHROMODORIS? PUNCTULIFERA, Bgh.
Doris? punctulifera, id. *l. c.* Heft vi. t. 1. f. 19, 20.
Hab. Pacific Ocean.

66. C. SCHULTZIANA.
D. elegans, Cantr. Bull. ii. p. 383 (1835).
D. picta, "Schultz," Philippi; *D. schultziana*, Delle Chiaje; *Goniodoris picta*, Gray; *Doriprismatica picta*, H. & A. Ad.; *G. elegans*, Fischer.
Chromodoris? elegans, Bgh.
Chr.? picta, Bgh.
Hab. Mediterranean, coast of France.

67. C. NARDII.
C.? nardii, Bgh.
D. nardii, Verany, Cat. an. inv. Golfo Genova, &c. pp. 16 & 20 (1846).
Hab. Gulf of Genoa; Nice.

68. C. INFUCATA.
C.? infucata, Bgh.
D. infucata, Rüpp. & Leuck. *l. c.* p. 34, t. 10. f. 3.
Goniodoris infucata, Gray; *Doriprismatica infucata*, H. & A. Ad.
? *D. marmorata*, Audouin (sec. Rüpp. & Leuck.).
Hab. Red Sea (Tor).

69. C. ELEGANS.
C.? elegans, Bgh.
D. elegans, Qu. & Gaim. *l. c.* p. 273, pl. 20. f. 12-14.
Goniodoris elegans, Gray; *Doriprismatica elegans*, H. & A. Ad.
Hab. Friendly Islands (Tongataboo).

70. C.? CITRINA, Bgh. *l. c.* Heft vi. t. 1. f. 14–17 (1874).
Hab. Pacific Ocean.

71. C. PALLESCENS, Bgh.[1] *l. c.* Heft viii. p. 81, t. 7. f. 4–4, & t. 9. f. 11–18.
Hab. Tahiti.

72. C.? SUBPULCHELLA.
C.? pulchella, Bgh.[2], Semper's Reise im Arch. der phil. 2te Th. 2te Bd. Heft v. t. 25. f. 11 (1873).
Hab. Philippine seas.

73. C. LUTEO-ROSA, Bgh.[3]
D. luteo-rosa, Rapp, *l. c.* p. 521, pl. 26. f. 6, 7.
Hab. Mediterranean.

[1] Not included in his list of *Chromodorides*.
[2] No description; the retractility of the branchiæ and rhinophores is not well shown in the figure. Bergh does not include it in his list of *Chromodorides*.
[3] The foot is described as smaller than the mantle, and Cantraine considers the animal near *D. guttata*, Risso.

74. CHROMODORIS MACCARTHYI.

D. maccarthyi, Kelaart, Ann. Nat. Hist. 3rd ser. iii. p. 292 (1859).
D. maccarthiana, id.
Hab. Coast of Ceylon.

75. C. GLENEI.

D. glenei, Kelaart, *l. c.* p. 294.
Hab. Coast of Ceylon.

76. C. AMABILIS.

D. amabilis, Kel. *l. c.* p. 294.
Hab. Coast of Ceylon.

77. C. FIDELIS.

D. fidelis, Kel. *l. c.* p. 295.
Hab. Coast of Ceylon.

78. C. PASINII.

D. pasinii, Verany, *l. c.* pp. 16 & 20.
Hab. Gulf of Genoa, and Nice.

79. C. PIRAINII.

D. pirainii, id. *l. c.* pp. 17 & 21.
Hab. Gulf of Genoa, and Nice.

80. C. CALCARÆ.

D. calcaræ, id. *l. c.* pp. 16 & 20.
Hab. Gulf of Genoa, and Nice.

81. C. RETICULATA.

D. reticulata, Qu. & Gaim. *l. c.* p. 273, pl. 20. f. 12–14.
Goniodoris reticulata, Gray; *Doriprismatica reticulata*, H. & A. Ad.
Hab. Tongataboo.

82. C. XANTHOLEUCA.

D. (*Glossodoris*) *xantholeuca*, Ehr. Symb. Phys. &c.
Glossodoris xantholeuca, Gray.
Hab. Red Sea.

83. C. ERYTHRÆA.

D. (*Glossodoris*) *erythræa*, Ehr. *l. c.*
Glossodoris erythræa, H. & A. Ad.
Hab. Red Sea.

84. C. IMPERIALIS.

D. prismatica, var. *imperialis*, Pease, Proc. Zool. Soc. 1860, p. 32.
Doriprismatica imperialis, id. Am. Journ. Conch. iv. p. 132 (1869).
Hab. Sandwich Islands.

85. CHROMODORIS PRISMATICA.
D. prismatica, var. *lineata*, Pease, *l. c.* p. 32.
Doriprismatica lineata, id. (1869).
Hab. Sandwich Islands.

86. C. VENULOSA.
D. venulosa, Leuckart, Brev. An. quor. Descr. p. 15 (1828).
Hab. Mediterranean.

87. C. KROHNII.
D. krohnii, Verany, *l. c.* pp. 17 & 21.
Hab. Gulf of Genoa; Nice.

88. C.? VILLÆ.
D. villæ, Verany[1], *l. c.* pp. 17 & 21.
Hab. Gulf of Genoa; Nice.

89. C.? LUTESCENS.
D. lutescens, "Delle Chiaje," Verany, *l. c.* pp. 16 & 20.
Hab. Gulf of Genoa; Nice.

90. C.? ORSINII.
D. orsinii, Verany, *l. c.* pp. 16 & 20.
Hab. Gulf of Genoa; Nice.

91. C. TENNENTIANA.
D. tennentiana, Kel. *l. c.* vol. iv. p. 208 (1849).
Hab. Ceylon.

92. C.? PRETIOSA[2].
D. pretiosa, Kel. *l. c.* vol. iii. p. 295.
Hab. Ceylon.

93. C.? BRACHYPHYLLA[3].
D. (*Pterodoris*) *brachyphylla*, Ehr. *l. c.*
Glossodoris brachyphylla, H. & A. Ad.
Hab. Red Sea (Tor).

94. C.? PICTURATA.
D. (*Pterodoris*) *picturata*, Ehr. *l. c.*
Glossodoris picturata, H. & A. Ad.
Hab. Red Sea (Suez).

95. C.? SPONSA.
D. (*Actinodoris*) *sponsa*, Ehr. *l. c.*
Actinodoris sponsa, Gray.
Hab. Red Sea (Ras Muhamed).

96. C.? MOLLITA, sp. nov. (Plate XXX. figs. 18, 19.)
Hab. ——?

[1] The branchiæ are said to be foliaceous. [2] Foot shorter than the mantle.
[3] The branchiæ are described as very short and ramulose.

97. CHROMODORIS? CÆRULEATA.

Hemidoris cæruleata, Stimpson, Proc. Ac. Nat. Sc. Phil. vii. p. 379 (1855).

Hab. China.

Gen. ORODORIS, Bergh, 1875.

Mantle (nothæum) somewhat as in *Miamira*, keeled above with transverse ribs; no frontal or caudal veils, or lateral lobes lamellate beneath. Foot rather narrow. Integument without spicules. Armature of the oral aperture as in *Miamira*—a spinous buccal collar. Odontophore as in *Miamira*; but the rachis is hardened[1]. (*Bergh.*)

O. MIAMIRANA, Bgh. *l. c.* Heft viii. p. 67, T. 7. f. 3–3, & T. 10. f. 9–20 (1875).

Hab. Tahiti.

Gen. CERATODORIS, Gray, 1850.

Echinodoris, Bergh, 1874.

Form rather depressed; back everywhere covered with elongated papillæ; back and papillæ spiculose. Rhinophores and branchiæ retractile. Odontophore with the pleuræ multidentate. Penis armed at the apex with series of minute uncini. (*Bergh.*)

Dr. Gray's diagnosis is very scanty, and, with little doubt, incorrect[2]. As M. Bergh remarks, Dr. Gray himself had not seen the animal for which he constituted the genus *Ceratodoris*. The name "*Echinodoris*" is decidedly more appropriate; but this does not seem a sufficient reason for giving up the earlier appellation.

C. EOLIDA, Gray.

Doris eolida, Quoy & Gaim. Voy. de l'Astr. Zool. ii. p. 263, pl. 18. f. 11–15.

? *Echinodoris eolida*[3], Bgh. Journ. des Mus. Godeff. Heft vi. p. 109, T. 3. f. 4–20 (1874).

Hab. Waigiou.

Gen. HEXABRANCHUS, Ehr. 1831.

? *Heptabranchus*, Adams, 1849.

Rhacodoris, Mörch, 1863 (part of).

Body soft; integument non-spiculose (?)[4]; rhinophores sharply bent, and with an anterior knee, retractile within marginated cavities;

[1] *Orodoris*, according to M. Bergh, is nearly related to his new genus *Miamira*, which, again, is closely allied to *Casella*. The large development of the mantle and the absence of marginal processes places the first among the Doridida, while the contrary characters approximate the two latter to the Polyceridæ. Perhaps the three genera may be regarded as intermediate between Doridida and Polyceridæ.

[2] Viz. "Tentacles elongate, filiform, not retractile."

[3] Quoy and Gaimard's appears to me a distinct species, judging from their description and figure of the rhinophores and papillæ: the arrangement of the branchiæ is also different.

[4] I can find no spicules in the 29 specimens, representing 5 or 6 species, which I have examined.

branchiæ generally small, numerous, ramose, non-retractile, arranged in 6 to 8 tufts, which are set in an open circle at some distance around the anal opening; oral tentacles large, fleshy, flat, ovoid or leaf-shaped, with crenulate edge. Odontophore broad, with numerous lateral simple spines in each transverse row: none median in position.

The species fall under two well marked divisions:—

a. *Those with the body depressed; the mantle non-pustulose, widely expanded, and attenuate at the border; and the mouth with two lateral more or less horny plates, forming a kind of prehensile collar.*

1. HEXABRANCHUS PRÆTEXTUS, Ehr. Symb. Phys. "An. Ev. excl. insect." (1831).

Hab. Red Sea.

2. H. SANGUINEUS, Gray.

D. sanguinea, Rüpp. & Leuck. Atlas &c., Neu. Wirb. Th. des R. Meers, p. 28, t. 8. f. 1 (1828).
Hab. Red Sea.

3. H. SUEZENSIS, Abraham, Ann. & Mag. Nat. Hist. 4th ser. vol. xviii. p. 137, pl. 6. figs. 3, 3 *a* (1876).

Hab. Red Sea.

4. H. SUPERBUS.

Doris superba, Gould, U.S. Expl. Exp., Mollusca, p. 301, pl. 23. fig. 395 (1852).
Actinodoris superba, H. & A. Adams.
Hab. Samoa Islands.

5. H. CARDINALIS, H. & A. Adams.

D. cardinalis, Gould, *l. c.* p. 302, pl. 25. fig. 397.
Hab. Sandwich Islands.

6. H. SUMPTUOSUS, H. & A. Adams.

D. sumptuosa, Gould, *l. c.* p. 303, pl. 24. fig. 398.
Hab. Tonga Islands.

7. H. SANDWICHENSIS, Gray.

D. sandwichensis, Souleyet, Voy. de la Corv. 'la Bonite,' Zool. ii. p. 451, pl. 25. f. 1–4 (1852).
Hab. Sandwich Islands.

8. H. MARGINATUS.

D. marginata, Quoy & Gaim. Voy. de l'Astrol. Zool. ii. p. 255, pl. 17. f. 1–5 (1832).
D. marginalis, Gray; *D. gloriosa*, Kelaart.
Hab. Amboina; Ceylon.

9. HEXABRANCHUS ORBICULARIS, sp. nov. (Plate XXX. figs. 23, 24.)

Hab. Mauritius.

10. H. ANEITEUMENSIS, sp. nov.

H. aneitensis, Bergh (in sched.).
Hab. Aneiteum.

11. H. MAURITIENSIS, sp. nov.

Hab. Mauritius, Rodriguez.

12. H. ADAMSII, Gray, Fig. Moll. An. iv. p. 104, t. 219. f. 1 (1850).

Hab. ——?

13. H. PULCHELLUS, Pease, P. Z. S. 1860, p. 33.

Hab. Sandwich Islands.

14. H. FAUSTUS, Bergh, figured in Semper's 'Reise,' Bd. ii. Heft ix. (1875) t. 41. f.

Hab. Philippine seas (?).

15. H.? FLAMMULATUS.

D. flammulata, Quoy & Gaim. *l. c.* p. 257, pl. 17. f. 6–10 (1832).
Actinodoris flammulata, Gray.
Hab. Friendly Isles.

16. H.? BURNETTII.

Heptabranchus burnettii, "A. Ad.," Gray, Fig. Moll. An. p. 104, t. 219, f. 2 (1850).
Hab. —— ?

b. *Those with the body subprismatic, and not much depressed; the mantle more or less pustulose, and its border but little expanded or attenuated; with no prehensile collar.*

17. H. LACERUS.

D. lacera, Cuv. Ann. du Mus. iv. p. 453, pl. 73. f. 1–3 (1804).
D. laciniata, Gray.
Hab. Timor.

18. H. PELLUCIDULUS, Abr. *l. c.* p. 136, pl. 6. f. 2, 2*a*–2*c*.

Hab. ——?

§ 2. LEPTOGLOSSÆ.

Gen. CALYCIDORIS, Abraham, 1876.

Body depressed; mantle ample, covered with soft papillæ; branchiæ simply laminate, arranged like a cup around the anus, subretractile in a common cavity. Oral tentacles represented by a fleshy, laterally extended veil. Odontophore narrow, bearing two bicuspid spines, one each side, in each transverse row; no central spine, spinous collar, or under jaw.

CALYCIDORIS GUENTHERI, Abraham, Ann. & Mag. Nat. Hist. 4th ser. vol. xviii. p. 133, pl. 6. f. 1, 1 *a*–1 *c* (1876).

Hab. ——?

Gen. LAMELLIDORIS, Ald. & Hanc. 1855.

Onchidoris, De Blainv. 1816[1]. *Onchidiorus*, Férussac, 1821. *Onchidora*, Cuv., 1830. *Villiersia*, D'Orbigny, 1837. *Oncidiodoris*, Agassiz, 1847. *Oncodoris*, Agassiz, 1847.

Body depressed. Mantle large. Head with a veil in place of oral tentacles. Branchiæ simply pinnate, set in an open circle or ellipse, non-retractile. Odontophore narrow, with a few spines in each transverse row.

This genus contains two well-defined divisions, first enunciated by Messrs. Alder & Hancock.

a. *Body not very depressed; mantle with moderate-sized spicula. Spawn of few coils, cup-formed. Odontophore with two large spines and two or more rudimentary ones; usually a simple central plate.*

1. L. ASPERA, Ald. & Hanc.

Doris aspera, id. Ann. & Mag. Nat. Hist. ix. p. 32 (1842), figured in Mon. Br. Nud. pl. 9. f. 1–9.

D. pallida, Agassiz. ? *D. fusca*, Fabricius[2].

Hab. North European shores; eastern coast of North America.

2. L. ACUTIUSCULA.

D. acutiuscula, "Stp.," Möller, Index Moll. Grön. in Nat. Tidssk. iv. p. 79 (1842–3).

Hab. Eastern coast of North America.

3. L. PROXIMA, Ald. & Hanc.

D. proxima, id. Mon. Brit. Nud. p. 42, and pt. 6, fam. 1, pl. 9. f. 10–16 (1854).

Hab. Danish and English coasts.

4. L. LOVENI.

D. muricata, "Müller," Lovén, Index Moll. Lit. Scand. &c. p. 5 (1846).

D. loveni, Ald. & Hanc.

Hab. North-European shores.

[1] *Onchidoris* was constituted by De Blainville in 1816 for a supposed species ("*O. leachii*") which we now know to be *L. bilamellata*, his specimen being still existing in the collection of the British Museum. This was pointed out by Alder and Hancock, and the erroneous characterization exposed, in 1854; nevertheless compilers of Zoological text-books and reference-books still continue to talk of "*Onchidoris leachii*;" and several of them have taken *Onchidoris*, in spite of its hypothetical characters, as the name of the whole genus.

[2] Morch considers it identical with *D. fusca*, Müller, and with *D. muricata*, Meyer and Möbius (non Müller).

5. LAMELLIDORIS MURICATA, Ald. & Hanc.

D. muricata, Müller, Zool. Dan. Prod. p. 229 (1776).
Onchidoris muricata, Gray.
Hab. Irish, Danish, and French coasts.

6. L. ULIDIANA, Ald. & Hanc.

D. ulidiana, Thompson, Ann. & Mag. Nat. Hist. xv, p. 312 (1845).
Hab. Irish coast.

7. L. DIAPHANA, Ald. & Hanc.

D. diaphana, id. Ann. & Mag. Nat. Hist. xvi. p. 313 (1845).
O. diaphana, Gray.
Hab. S. of England and Danish coasts.

8. L. OBLONGA, Ald. & Hanc.

D. oblonga, id. Ann. & Mag. Nat. Hist. xvi. p. 314 (1845).
Hab. S. coast of England.

9. L. DERELICTA.

D. derelicta, Fischer, Journ. de Conch. xv. p. 7 (1867).
D. verrucosa, "Cuv.," Delle Chiaje, &c. [*sec.* Fischer].
Hab. French coasts.

10. L. BILAMELLATA, Ald. & Hanc.

D. bilamellata, Linnæus, Syst. Nat. ed. 12, p. 1083 (1767).
D. fusca, Müller; *D. verrucosa*, Pennant; *D. elfortiana*, De Bl.
O. leachii, De Bl.; *D. vulgaris*, Leach; *D. obvelata*, Bouch.-Chant.
D. affinis, Thomps.; *D. liturata*, "Beck," Miller; *D. coronata*, Agassiz.
Oncidoris bilamellata, Hogg; *L. leachii*, Mörch.
Hab. Coast of N. Europe, Iceland, Greenland, East N. America, and Vancouver Island.

11. L. TUBERCULATA.

Onchidoris tuberculatus, Hutton, Reports &c. New Zealand, Mar. Moll. p. 53 (1873).
Hab. New Zealand.

12. L. DIADEMATA.

D. diademata, Agass. 1850 (no descr. or fig.), Gould, Inv. of Massachusetts, 2nd ed. p. 230, pl. 21. f. 298, 300–304 (1870).

13. "L. n. sp. ?," Mörch, Vidensk. Meddelels. for 1871, p. 23.
Hab. Danish Seas.

b. *Body very depressed, with large spicules symmetrically arranged. Spawn of many narrow coils. Odontophore with two large broad spines and two rudimentary ones; no central plate.*

14. LAMELLIDORIS DEPRESSA, Ald. & Hanc.

D. depressa, Ald. & Hanc. Ann. & Mag. Nat. Hist. ix. p. 32.
Villiersia scutigera, D'Orb.[1] Mag. de Zool. vii. "Mém. sur des esp. &c. de l'ord. des Nud." p. 14, pl. 109. f. 1–4 (1837).

15. L. INCONSPICUA, Ald. & Hanc.

D. inconspicua, id. Mon. Br. Nud. Moll. p. 43, and pt. 5, fam. 1. pl. 12. f. 9–16 (1851).
Onchidoris inconspicua, Gray.
Hab. British coast (Northumberland).

16. L. GRISEA.

D. grisea, "Stimps. MS.," Gould, Inv. Mass. 2nd ed. p. 232, pl. 20. f. 292, 295 (1870).
Hab. E. N. America (Massachusetts).

17. L. TENELLA.

D. tenella, Agass. 1850 (no descr. or fig.); Gould, *l. c.* p. 229, pl. 20. f. 289, 290, and 293.
Hab. E. N. America (Massachusetts).

18. L. PUSILLA, A. & H.

D. pusilla, id. Ann. & Mag. Nat. Hist. xvi. p. 313 (1845).
O. pusilla, Gray.
Hab. S. coast of England (Devonshire).

19. L. SPARSA, A. & H.

D. sparsa, id. *l. c.* vol. xviii. p. 293 (1846).
O. sparsa, H. & A. Adams.
Hab. British coast (Cullercoats).

20. L. LUTEOCINCTA.

D. luteocincta, M. Sars, Bidr. til Kundsk. Chr. Faun. ii. p. 77 (1870).
Hab. Scandinavian coast (Vallo).

21. L. ECHINATA.

D. echinata, Lovén, Ind. Moll. Lit. Scand. &c. p. 5 (1846).
"? *D. affinis* A. & H.," Lovén.
Hab. West Scandinavian shores (Boh).

[1] Messrs. Alder and Hancock showed that the *Villiersia scutigera* of D'Orbigny was closely allied to, if not identical with, *L. depressa*, and that the generic characters were based upon erroneous observations—a view since confirmed by M. Fischer. Notwithstanding this, the genus "*Villiersia*," like "*Onchidoris*," still finds a place in our text-books.

22. LAMELLIDORIS ? EUBALIA.

D. eubalia, Fischer, Journ. de Conch. xx. p. 10 (1872).
Hab. French coast (Gironde).

23. L. "? n. sp."[1] Mörch, *l. c.* p. 24.
Hab. Danish Seas.

Gen. ACANTHODORIS, Gray (1850).

Body convex; mantle moderate in size, covered with soft papillæ. Oral tentacles united in a veil, with free flattened lateral ends. Branchiæ united at the base, non-retractile. Odontophore narrow, with 2 large spines and several rudimentary ones in each transverse row, none central; usually a spinous buccal collar and rudimentary under jaw.

1. A. PILOSA, Gray.

Doris pilosa, Müller, Zool. Dan. iii. p. 7, t. 65. f. 5–8 (1789).
"*Het eegeltze of de Zeeslak met eene ster ob de stint*," Bommé.
D. stellata, Gmelin; *D. lævis*, Cuv.; *D. nigricans*, Fleming; *D. flemingii*, Forbes; *D. sublævis*, Thompson; *D. similis*, A & H.; *D. fusca*, Lovén; *D. tomentosa*, Lov.; ? *D. rocinella*, Leach.
Hab. European coasts; Eastern North America.

2. A. MOLLICELLA, sp. nov. (Plate XXX. figs. 1–4.)
Hab. Lord Auckland's Islands.

3. A. GLOBOSA, sp. nov. (Plate XXX. figs. 5–9.)
Hab. New Zealand.

4. A. SUBQUADRATA, Ald. & Hanc.

D. subquadrata, id. Ann. & Mag. Nat. Hist. xvi. p. 313 (1845), and fig. in Mon. Br. Nud. pl. 16. f. 1–3.
D. quadrangulata, Alder.
Hab. British coasts.

Fam. II. POLYCERIDÆ, A. & H. 1855.

Les Doris prismatiques, Cuv. 1804 (part of).
Subfam. *Polycerinæ*, A. & H. 1845.

Mantle small or obsolete, generally with marginal appendages, integument usually spiculose. Rhinophores various, often laminated.

Messrs. Alder and Hancock divide the Polyceridæ into two sections, according as the rhinophores are retractile or non-retractile. This gives a convenient arrangement.

§ A. *Rhinophores retractile within sheaths; the odontophore broad.* (EURYGLOSSÆ.)

Gen. MIAMIRA, Bergh, 1874.

Mantle (nothæum) anteriorly produced into a frontal veil, and

[1] This may be a *Doris* allied to *D. verrucosa*.

furnished with lateral flattened lobes, lamellate below, behind continued into a caudal veil, above keeled and with transverse ribs. Oral aperture armed with a spinous buccal collar. Odontophore broad, with numerous series of teeth, many of them multidentate; the rhachis unarmed. (*Bergh.*)

1. MIAMIRA NOBILIS, Bgh. Journ. des Mus. Godeff. Heft 6, T. 1. f. 5; and T. 4. f. 29–33 (1874), & Bd. ii. T. 33. f. 2, & p. 411.

Hab. Philippine seas, Albany, Samoa, Amboina.

Gen. CASELLA, H. & A. Adams, 1858.

Body compressed, elongated. Mantle margin small, forming undulated lobate or erect crests along the sides of the back. Rhinophores laminated, retractile. Foot narrow. Oral aperture armed. Odontophore with numerous minute spines, none median.

1. C. ATROMARGINATA, Bgh.

Doris atromarginata, Cuv. Ann. du Mus. iv. p. 473, pl. 74. f. 6 (1804). *D. caudale*, Lamk.

Doriprismatica atromarginata, D'Orb.; *Goniodoris atromarginata*, Gray; *C. philippinensis*, Bgh.

Hab. Pacific Islands, Philippines, New Guinea, Australia, &c.

2. C. GOULDII, H. & A. Adams, Gen. Rec. Moll. ii. p. 57, pl. 63. f. 5 (1858).

Hab. Australia.

Gen. KALINGA, Alder & Hancock, 1864.

Body oval, subprismatic. Margin of mantle most developed in front, where there is a row of close-set papillated processes extending over the head; a few similar processes are upon the sides of the back. Rhinophores laminated. Oral tentacles flattened. Branchiæ non-retractile, placed separately in a circle at some distance around the anal opening. Odontophore broad, with numerous rather distant rows of tricuspid spines. No jaws or collar.

1. K. ORNATA, Ald. & Hanc. Trans. Zool. Soc. v. p. 135, pl. 32. f. 7–10 (1864).

Hab. Coromandel coast.

Gen. TRIOPA, Johnston, 1838.

Tritonia, Lamarck, 1801. *Themisto*, Oken (part of), 1815. *Euplocamus*, Philippi, 1836 (part of). *Cladophora*, Gray, 1840.

Body more or less depressed. Mantle small, covering the head, the margin with linear subclavate or branched appendages. Rhinophores laminated. Oral tentacles cylindrical or ovoid. Branchiæ few, non-retractile. Odontophore broad, with numerous plates, the two or three inner ones with large spines, none central.

Triopa was instituted by Johnston for the *Doris clavigera* of Müller. Messrs. Alder and Hancock proposed to retain as well the

genus *Euplocamus* for the *E. croceus* of Philippi. The differences between the two genera, however, appear to be more of degree than of kind, and serve better for distinguishing sections of one genus; moreover the latter name is in general use for a genus of Insects, as well as for a genus of Birds. *Euplocamus* originally took in the *Idaliæ*. Oken's *Themisto* included *Polycera quadrilineata* and *Triopa clavigera*.

a. *The lateral marginal processes linear or subclavate; oral tentacles cylindrical; the two inner lateral plates of the odontophore bearing large spines.*

1. TRIOPA CLAVIGERA, Johnston.

Doris clavigera, Müller, Zool. Dan. Prod. p. 229 (1776).
Tergipes pulcher, Johnst.; *Polycera claviger*, Sars; *Euplocamus plumosus*, Thompson; *Euplocamus claviger*, Thompson.
Hab. North European coasts.

2. T. LACERA.

Doris lacera, Müller, Zool. Dan. iv. p. 23, t. 138. f. 3, 4 (1806).
T. lacera, "Müller," Lovén.
Hab. Scandinavian seas.

3. T. INCISA, M. Sars, On some Remark. Forms, &c. i. p. 35, pl. 3. f. 1–3 (1872).
Hab. Coast of Norway (Christiana).

4. T. CATALINÆ, Cooper, Proc. Cal. Ac. Nat. Sc. iii. p. 59 (1863).
Hab. Coast of Western North America (Catalina Island).

5. T. CARPENTERI, Stearns, Proc. Cal. Ac. Nat. Sci. v. p. 78 (1873).
Hab. Monterey (California).

6. T. HOLBÖLLII.

Euplocamus holböllii, Möller, Ind. Moll. Grœnl., in Nat. Tidsskr. iv. p. 79 (1842); *Polycera holböllii*, "Möll.," Stimpson.
Hab. Greenland shores.

7. T.? GRACILIS, Pease, Am. Journ. Conch. vi. p. 301, pl. 19. f. 3, *a–d*.
Hab. Huaheine.

b. *Lateral marginal processes branched or papillated; oral tentacles as ovoid lobes; the three inner lateral plates of the very broad odontophore bearing large spines; a spinous buccal collar.*

8. T. CROCEA.

Euplocamus croceus, Philippi, En. Moll. Sic. i. p. 103, pl. 7. f. 1 (1836).

? *E. frondosus*, id.; ? *Doris ramosa*, Cantraine; ? *Idalia ramosa*, Phil.; *Idalia crocea*, id.

Hab. Mediterranean, and south coast of England (Cornwall).

9. TRIOPA YATESII, Angas, Journ. de Conch. xii. p. 60, pl. 5. f. 8 (1864).

Hab. New South Wales.

Gen. THECACERA, Fleming, 1828.

Body limaciform, smooth. Mantle obsolete; supracapital veil indistinct. Rhinophores laminated. No oral tentacles. Branchiæ non-retractile, with linear or tubercular lateral appendages. Odontophore broad, with 12–14 plates; the two inner on each side bearing bicuspid spines; no central plate. Small lateral corneous jaws.

a. *Rhinophores with completely surrounding sheaths.*

1. T. VIRESCENS, Ald. & Hanc. Ann. & Mag. Nat. Hist. 2nd ser. viii. p. 290 (1851).

Hab. S. coast of England (Cornwall).

2. T. CAPITATA, Ald. & Hanc. Mon. Br. Nud. Moll. p. 44, & Append. p. iv (1855).

Hab. S. coast of England (Cornwall).

b. *Rhinophores with partially surrounding sheaths.*

3. T. PENNIGERA, Fleming.

Doris pennigera, Montagu, Trans. Linn. Soc. xi. p. 17, t. iv. f. 5 (1815).

Polycera pennigera, Fleming.

Hab. N. European coasts (England, France).

Gen. CRIMORA, Alder & Hancock, 1862.

Body limaciform. Mantle nearly obsolete, forming a supracapital veil with branched appendages, and a papillated ridge along each side of the back. Rhinophores laminated. Oral tentacles tubercular. Branchiæ non-retractile, placed about two thirds down the centre of the back. Tail short, without a dorsal carina. Odontophore broad, bearing 26 or 27 spines on each side of three kinds; the innermost one is large, hooked, and bicuspid; the next 5 or 6 are short and obtuse, and supported on subquadrilateral plates; the rest very long, slender, and minutely denticulated on the inner margin. No central spine.

C. PAPILLATA, Ald. & Hanc. Ann. & Mag. Nat. Hist. 3rd ser. x. p. 263 (1862).

Hab. Guernsey.

Gen. PLOCAMOPHORUS, Rüppell & Leuckart, 1828.

Plocamoceros, Cuvier, 1830. *Plocamophorus*, Gray, 1842. *Peplidia*, Lowe, 1842. *Histiophorus*, Pease, 1860.

Body limaciform. Mantle represented by a supracapital veil bearing tuberculate or branched appendages on the margin, and by two or three tubercular processes upon each side of the back. Rhinophores laminate. Oral tentacles flat. Branchiæ few, non-retractile. Tail dorsally carinated. Odontophore with the spines near the middle bicuspid, none median in position. An incomplete buccal collar.

1. P. OCELLATUS, Rüpp. & Leuck. Atl. zu der Reise nörd. Afrik., "Neue Wirb. Th. des roth. Meers," p. 17, T. 5. f. 3.
Hab. Red Sea.

2. P. CEYLONICUS, Ald. & Hanc.
Polycera? *ceylonica*, Kelaart, Ann. & Mag. Nat. Hist. 3rd ser. iii. p. 489 (1859); figured by Ald. & Hanc. T. Z. S. vol. v. pl. 32. f. 4–6.
Hab. Coromandel and Ceylon coasts.

3. P. IMPERIALIS, Angas, Journ. de Conch. xii. p. 52, pl. 5. f. 7 (1864).
Hab. New South Wales.

4. P. MACULATUS.
Histiophorus maculatus, Pease, P. Z. S. 1861, p. 36.
Hab. Sandwich Islands.

5. P. MADERÆ.
Peplidia maderæ, Lowe, P. Z. S. 1842, p. 51.
Hab. Madeira.

6. P. NÆVATUS, Abraham, Ann. & Mag. Nat. Hist. 4th ser. xviii. p. 139, pl. 6. f. 4, 4 *a*.
Hab. New South Wales.

7. P. LEVIVARIUS, Abraham, Bull. de la Soc. Zool. de France, 1876, p. 287, f. 1–4.
Hab. ——?

8. P. ? sp.[1], figured in Krusenstern's 'Atlas,' T. 88. f. (1813).
Hab. ——?

9. P. TILESII, Bergh; figured partially in Semper's 'Reise,' T. 51. f. 17–27, & T. 53. f. 1–4 (1876).
Hab. ——?

10. P. RAMULOSUS.
Polycera? *ramulosa*, Stimpson, Proc. Ac. Nat. Sci. Phil. vii. p. 379 (1855).
Hab. China.

[1] I have been unable to see the text of Krusenstern. In case the animal has not been named by Tilesius, I have elsewhere proposed *flagellatus* for its specific name, on account of the flagellate lateral prolongations of the supracapital veil.

Gen. Ægirus, Lovén, 1846.

Ægires, Lovén, 1844.

Body convex, covered with large tubercles. Mantle indistinct, represented by a supracapital veil, and by a tubercular ridge along each side. Rhinophores linear, smooth or hispid. Branchiæ non-retractile. Odontophore with simple, curved lateral spines; no central spine. An upper corneous jaw.

1. Æ. punctilucens, Lovén.

Polycera punctilucens, D'Orbigny, Mag. de Zool. vii. p. 7, pl. 106. f. 1–3 (1837).
Doris maura, Forbes; *Ægires punctilucens*, Lovén.
Hab. North European coasts.

2. Æ. leuckartii, Verany, Journ. de Conch. iv. p. 388 (1853).

Hab. Mediterranean (Nice).

3. Æ. hispidus, Hesse, Journ. de Conch. xx. p. 346 (1872), and figured xxi. pl. 12. f. 3–7.

Hab. Coast of France (Brittany).

Gen. Notodoris, Bergh, 1875.

Body limaciform (the back not distinct from the sides). Rhinophores smooth, retractile in cavities protected by valves. No buccal armature. Lingual teeth, none median, the lateral ones erect and hook-shaped. (*Bergh.*)

N. citrina, Bergh, *l. c.* Heft viii. p. 64, T. 9. f. 32–45, & T. 10. f. 1-8 (1875).

Hab. Rarotonga.

Gen. Ceratosoma, Adams & Reeve, 1848.

Body elongate, prismatic, smooth, ending in a bluntly pointed tail; the dorsal surface passes into a postbranchial fleshy protuberance. Mantle obsolete. Rhinophores laminated. Branchiæ with the roots more or less coherent, placed in front of, and partially around, the tubular anus, with which they are retractile into a common, smoothly margined cavity. Odontophore with numerous rows of simple spines, none of which are central. A spinous buccal collar.

1. C. cornigerum, Adams & Reeve, Zool. of Voy. of Samarang, "Moll. &c." p. 68, pl. 19. f. 5 (1848).

Doris trifida, Gray; *C. trilobata*, id.
Hab. Sooloo and Philippine seas.

2. C. trilobatum, Adams.

D. trilobata, Gray, M. E. Gray's Fig. Moll. An. iv. p. 13, t. 67. f. 14 (1850).
C. trilobata, id.

3. CERATOSOMA GRACILLIMUM, "Semper," Bgh. in Semper's 'Reise im Arch. d. Phil.' 2te Th. 2te Bd. Heft v. T. 25. p. 8 (1873), & Heft x. p. 403 (1876).

Hab. Philippine sea.

4. C. CALEDONICUM, Fischer, Journ. de Conch. sér. 3, tom. xvi. p. 92 (1876).

Hab. New Caledonia.

5. C. TENUE, Abraham, Ann. & Mag. Nat. Hist. 4th ser. xviii. p. 141, pl. 7. f. 5, 5 *a*, 5 *b* (1876).

Hab. ——?

6. C. BREVICAUDATUM, id. *l. c.* p. 142, pl. 7. fig. 6.

Hab. Australia.

7. C. OBLONGUM, id. *l. c.* p. 143, pl. 7. f. 7, 7 *a*, 7 *b*.

Hab. W. Australia.

8. C.? WEBBII[1].

Polycera webbii, D'Orbigny, Hist. Nat. des îles Canar. ii. "Moll." p. 41, pl. 4. f. 8–10 (1837).

Goniodoris webbii, Gray; *Doriprismatica webbii*, H. & A. Ad.

Hab. Canary Isles.

Gen. TREVELYANA, Kelaart, 1858.

Gymnodoris, Stimpson[2], 1855. *Stenodoris*, Pease[3], 1866.

Body limaciform, rather swollen or raised on the central region. Mantle obsolete. No appendages. Rhinophores laminate and retractile. Branchiæ pinnate, non-retractile, placed round the anus almost on the centre of the back. Mouth without oral tentacles or veil, and without collar or jaws. Odontophore broad, bearing simple spines.

1. T. CEYLONICA, Kel. Ann. & Mag. Nat. Hist. 3rd ser. i. p. 257, pl. 10 B. f. 1, 2 (1858).

T. zeylanica, id.

Hab. Ceylon.

[1] This may prove to be the type of a new genus; from D'Orbigny's description it would seem to be intermediate in character between *Ceratosoma* and *Polycera*.

[2] Stimpson's diagnosis is:—"Limaciform, smooth. Similar to *Polycera*, but different in wanting branchial appendages and a veil. Branchiæ likewise simple." It seems to me that there is little doubt that this is synonymous with Kelaart's genus. The name *Trevelyana*, however, has been generally employed, although enunciated three years subsequently to *Gymnodoris*; and, moreover, we cannot be *quite* sure of their identity until Stimpson's specimens be properly examined.

[3] Mr. Pease's *Stenodoris* does not appear to differ essentially from Kelaart's genus. He states that "the body is deeply incised on either side, a short distance behind the dorsal tentacles," and that the branchiæ are "subretractile."

2. TREVELYANA BICOLOR, Ald. & Hanc. Trans. Zool. Soc. vol. v. p. 132, pl. 29. f. 11, 12 (1864).

Hab. Madras coast.

3. T. IMPUDICA.

Doris impudica, Rüpp. & Leuck. *l. c.* p. 33, T. 10. f. 2.
Hab. Red Sea.

4. T. LIMACINA.

D. limacina, Quoy & Gaim. Voy. de l'Astrol. Zool. ii. p. 252, pl. 16. f. 8, 9 (1832).
Hab. Amboina.

5. T. MOROSA, Bergh, Semper's Reise, 2te Th. 2te Bd. Heft v. T. 25. f. 9.

Hab. Philippine sea.

6. T. CONCINNA, Abraham, *l. c.* p. 145, pl. 7. f. 8, 8 *a*, 8 *b*.

Hab. Red Sea (Gulf of Suez).

7. T. PICTA, Pease, Am. Journ. Conch. vi. p. 301, pl. 20. f. 1 (1872).

Hab. Huaheine.

8. T. MACULATA.

Gymnodoris maculata, Stimpson, Proc. Ac. Nat. Sci. Phil. vii. p. 379 (1855).
Hab. Loo Choo.

9. T. RUBRA.

Stenodoris rubra, Pease, *l. c.* vol. ii. p. 206, t. 4. f. 2 (1866).
Hab. Pacific Islands.

10. (?) T. sp.?, Bergh, figured in Semper, *l. c.* T. 33. f. 5 (1874).

Hab. Philippine sea (?).

11. (?) T. sp.?, id., figured in Semper, *l. c.* f. 6.

Hab. Philippine sea (?).

Gen. NEMBROTHA, Bergh.

In Semper's 'Reise im Archipel der Philippinen,' Bd. ii. Heft ix. (1875) T. 41, M. Bergh figures a Nudibranch, apparently resembling a *Trevelyana*, under the name *Nembrotha citrina*. As no particulars accompany the drawing, the characteristics of the genus cannot here be given.

N. CITRINA, Bergh, in Semper, *l. c.* T. 41. f. 5.

Hab. Philippine seas (?).

§ B. *Rhinophores non-retractile. Odontophore narrow.* (STENOGLOSSÆ.)

Gen. GONIODORIS, Forbes (1840).

Doriprismatica, D'Orb. (1837, part of); *Pelagella*, Gray (1850).

Body rather depressed; mantle distinct with waved or scalloped margin. Rhinophores laminated. Oral tentacles flattened. Branchiæ non-retractile. Odontophore with four plates in each transverse row; the two next the median line bearing each a large spine; no central plate. A spinous buccal collar.

1. G. NODOSA, Forbes.

? *Doris electrina*, Pennant (1777); *Doris nodosa*, Montagu, Linn. Trans. ix. p. 107, pl. 7. f. 2 (1804); *G. emarginata*, Forbes; *D. barvicensis*, Johnston.

G. elongata, Thompson; *Doriprismatica nodosa*, H. & A. Adams.

Hab. Shores of N. Europe.

2. G. DANIELSSENI, Friele & Hansen, Bidr. til Kundsk. om de Norsk. Nudibr. p. 4 (1875).

Hab. Bergen.

3. G. CASTANEA, Ald. & Hanc. Ann. & Mag. Nat. Hist. xvi. p. 314 (1845).

Doris paretii, Verany; *Pelagella paretii*, Gray.

Goniodoris paretii, Ver.; *Doriprismatica paretii*, H. & A. Adams.

Hab. British and Norman coasts, and the Mediterranean.

4. G. MODESTA, Ald. & Hanc. Trans. Zool. Soc. v. p. 132, pl. 28. f. 12 (1864).

Hab. Coast of Madras.

5. G. CITRINA, id. *l. c.* p. 131, pl. 32. f. 1–3.

Hab. Coast of Madras.

6. G. ASPERSA, id. *l. c.* p. 131, pl. 33. f. 2.

Hab. Coast of Madras.

7. G. ? sp.

Pelagella, sp., "a drawing by M. Œrsted," Mörch, Journ. de Conch xi. p. 35 (1863).

Hab. Santa Cruz.

8. G. ? FLAVIDULA[1], Bergh, in Semper's Reis. &c., Heft. v. T. 25. f. 10 (1873).

Hab. Philippine sea.

[1] No description given. The figure resembles *Chromodoris*; but the rhinophores are apparently non-retractile.

9. GONIODORIS? VERRUCOSA[1].

G. verrucosa, Crosse, Journ. de Couch, xii. p. 56, pl. 5. f. 4 (1864).

Chromodoris verrucosa, Bergh.

Hab. Port Jackson.

Gen. AËTHEDORIS.

Alder & Hancock figure in vol. 5 of the Zoological Society's 'Transactions,' a form belonging to a new genus "apparently related to *Goniodoris*." As no specimen came into their hands, they could give no description. The most striking characteristic, seen in the drawing, is the expansion of the bilobed head, each lobe being semicrescentic, with the apex curving backwards and the margin bearing 12 to 14 conical dentations.

A. INDICA.

Figured, Alder & Hanc. Trans. Zool. Soc. v. pl. 33. f. 20 (1864).

Hab. Madras coast.

Gen. IDALIA, Leuckart (1828).

Euplocamus, Philippi (1836, part of).

Body convex, smooth. Mantle indistinct, the margin bearing filaments, generally longest in front. The head is produced anteriorly. Rhinophores linear, laminated. Branchiæ simply pinnate, non-retractile. Odontophore with 4 spines in each tranvserse row, the two middle ones large, no central spines. A spinous buccal collar.

Messrs. Alder & Hancock have thus divided the species :—

a. *Centre of back with filaments. Inner lingual spines falcate and nearly smooth; external spines short. Spinous collar complete.*

1. I. ELEGANS, Leuck. Brev. An. quor. Descr. p. 15, f. 2 (1828).

I. laciniosa, Phil. *Euplocamus laciniosus*, id.

Hab. Mediterranean; coast of France and Channel Islands.

2. I. LEACHII, Ald. & Hanc., figured Mon. pl. 27.

I. elegans, Alder, Trans. Tynes. Club, i. p. 112 (1848).

Hab. British coasts.

3. I. CIRRIGERA, Phil. En. Moll. Sic. ii. p. 77, t. xix. f. 4 (1844).

Hab. Sicilian shores.

4. I. TENTACULATA, Stimps. Proc. Ac. Nat. Sc. Phil. vii. p. 379 (1855).

Hab. China.

[1] The figure seems to show that the rhinophores are retractile; if so the animal cannot be a *Goniodoris*; there is no means of judging as to the retractility of the branchiæ, which are "voluminous and ramifying" and therefore probably not belonging to *Chromodoris*. The elongated tubercles covering the body and the sober coloration are also not characteristics of a *Chromodoris*.

b. *Centre of back without filaments. Inner lingual spines recurved and denticulate; external spines hooked. Spinous collar incomplete and bilobed.*

5. IDALIA ASPERSA, Ald. & Hanc., Mon. Br. Nud. Moll. p. 46, pt. 1, fam. 1. pl. 26 (1845).

I. cirrigera, Lovén. ? *I. caudata*, Œrst.

Hab. North European coasts.

6. I. INÆQUALIS, Forbes & Hanl. Brit. Moll. iii. p. 579, pl. 20. f. 4 (1853).

Hab. Shetland Isles.

7. I. QUADRICORNIS, Forbes & Hanl.

Doris quadricornis, Montagu, Linn. Trans. xi. p. 17, pl. 4. f. 4 (1815).

Hab. South coast of England (Devonshire).

8. I. PULCHELLA, Ald. & Hanc. *l. c.* p. 46, and Append. p. v (1855).

Hab. South coast of England (Cornwall).

Genus ANCULA, Lovén, 1846.

Miranda, Alder & Hancock, 1847; *Drepania*, Lafont, 1874.

Body limaciform, smooth. Mantle obsolete, forming an indistinct ridge near the branchiæ, bearing one or more appendages. Rhinophores laminate, bearing styliform basal appendages. Head produced at the sides into tentacular processes. Odontophore with four spines in each transverse row, the two next the median line large and broad, with the inner margin denticulated; no central spine. A spinous buccal collar.

M. Lafont states his *Drepania* to differ from *Ancula* in the head bearing two elongated tentacles analogous to those of *Eolis*, in the branchiæ not being surrounded by linear appendages, and in the rhinophore carrying but one filament instead of two. Unless the lingual characters prove to be importantly different from those of *Ancula*, it would seem advisable to unite *Drepania* with the latter genus.

a. *With several appendages near the branchiæ.*

1. A. CRISTATA, Lovén.

Polycera cristata, Alder, Ann. & Mag. Nat. Hist. vi. p. 340, t. ix. f. 10-12 (1841).

Miranda cristata (*Ancula cristata* in text), Ald. & Hanc.

Hab. North European shores.

2. A. SULPHUREA[1], Stimpson, Mar. Inv. of Grand Manan, p. 26 (1853).

Hab. Eastern North America (Grand Manan).

[1] It is doubtful whether this be not a variety of *A. cristata*.

b. *With but one pair of appendages near the branchiæ.*

3. ANCULA FUSCA.

Drepania fusca, Lafont, Journ. de Conchyl. xxii. p. 369 (1874).
Hab.

Gen. POLYCERA, Cuvier, 1817.

Themisto, Oken, 1815 (part of); *Cufæa*, Leach, 1820; *Polycere*, Risso, 1826; *Polycerus*, Verany, 1846.

Body limaciform. Mantle indistinct, forming a supracapital veil, and a tuberculate ridge on the sides. Rhinophores laminated. Branchiæ non-retractile, with lateral appendages. Odontophore with twelve to sixteen plates in each transverse row, the two near the centre large and bicuspid; no central spine. Lateral corneous jaws.

Messrs. Alder and Hancock classify the species under two well-marked divisions.

a. *Supracapital veil dilated, with the margin bearing tentacular filaments. Branchiæ simply pinnate; their lateral appendages elongated and few.*

1. P. QUADRILINEATA, Sars.

Doris quadrilineata, Müller, Zool. Dan. Prod. p. 229 (1776).
D. cornuta, Abildg.; *D. flava*, Mont.; *Themisto quadrilineata*, Oken; *T. flava*, id.; *Cufæa flava*, Leach; *Polycere flava*, Risso; *Polycera flava*, Fleming; ? *P. varians*, Sars; *P. ornata*, D'Orb.; *P. typica*, Thompson; *P. cornuta*, Lovén.
Hab. North and south European coasts.

2. P. HORRIDA, Hesse, Journ. de Conch. xx. p. 345 (1870); figured, xxi. pl. 12. f. 1, 2.
Hab. French coast.

3. P. PLEBEJA, Lovén, Ind. Moll. Scand. p. 6 (1846).
Hab. West Scandinavian shores.

b. *Supracapital veil short, bilobed, the margin tuberculate. Branchiæ plumose, their lateral appendages tubercular and more numerous.*

4. P. OCELLATA, Ald. & Hanc. Ann. & Mag. Nat. Hist. ix. p. 33 (1842).
? *Triopa nothus*, Johnston; *P.* (*Palio*) *ocellata*, Mörch.
Hab. North European coasts.

5. P. LESSONII, D'Orbigny, Mag. de Zool. vii. p. 5, pl. 105 (1837).
P. citrina, Alder; *Doris illuminata*, Gould; *P. modesta*, Lovén; *Ægires lessonii*, Gray; *P. illuminata*, Stimpson.
Hab. North European coast, and Eastern North America (Massachusetts).

6. P. PUDICA, Loven, *l. c.* p. 6.
Hab. West Scandinavian shores.

7. POLYCERA DUBIA, Sars, Bidrag, p. 13, t. 2. f. 5, 6 [*sec.* Sars, Besk. og Iagtt. 1835].

Idalia dubia, Gray.

Hab. Norway (Bergen).

8. P. COOKI, Angas, Journ. de Conch. xii. p. 58, pl. 5. f. 6 (1864).

Hab. Australia (Botany Bay).

9. P.? CAPENSIS[1].

Polycera capensis, Qu. & Gaim. in Freycinet, Voy. des Corv. l'Uranie et la Physic., Zool. p. 417, pl. 66. f. 4 (1824).

Hab. Cape of Good Hope.

Gen. BRACHYCHLANIS, Ehrenberg, 1831.

Mantle very small, forming a dorsal arena, with narrow upturned border. Rhinophores laminated, arising in front of the mantle-margin. Branchiæ retractile. Mouth terminal.

B. PANTHERINA, Ehr. Symb. Phys., An. evert. excl. ins.

Hab. Red Sea.

Fam. III. DORIDOPSIDÆ, Alder and Hancock, 1864.

Doris-like Mollusca, without well-developed spicula in the integument, with the mouth suctorial, opening on the front margin of the foot, with a retractile proboscis, but destitute of odontophore, jaws, or spinous collar.

The absence of an odontophore, so generally possessed by the cephalophorous Mollusca, justified Messrs. Alder and Hancock in raising this group to the rank of a family.

Gen. DORIDOPSIS, Alder & Hancock, 1864.

Doriopsis, Pease, 1860; *Rhacodoris*, Mörch, 1863 (part of); *Haustellodoris*, Pease, 1871.

Body more or less depressed, ovate or elliptical. Mantle ample, covering the head and the foot, smooth or with soft tubercles, and without marginal appendages. Rhinophores laminated and retractile within cavities. Head indistinct, generally with two small lateral lobes, but without proper oral tentacles. Branchiæ generally ramose, retractile with the anus into a common cavity.

This genus, as thus characterized, was first constituted by Alder and Hancock. Mr. Pease's "*Doriopsis*" had previously been published; but, as defined by him[2], no one could consider it

[1] The description and drawing are too imperfect to determine whether this is a *Polycera* or not.

[2] "Oblong or oval, depressed. Mantle large, covering head and foot. Dorsal tentacles two, lamellated and retractile, non-pedunculate. Orals none. Branchial plumes disposed in the form of a semicircle, on the posterior portion of the back, and retractile into a similarly formed slit, the convex portion posteriorly."—PEASE, 1860.

identical with *Doridopsis*. In 1871 Mr. Pease still adhered to his own genus; and he did not consider it synonymous with Alder and Hancock's, for which he at the same time proposed the name *Haustellodoris*.

While agreeing with M. Bergh that Mr. Pease's forms are probably species of Alder and Hancock's genus, we cannot follow him in adopting "*Doriopsis*" as the generic name, not only because none but Mr. Pease's own species, about which we cannot always feel sure, will fall under that genus as defined by him, but also because the root of "Doris" is "Dorid-," and not "Dori-;" so that "*Doridopsis*" is more correct etymologically than "*Doriopsis*."

List of Species[1].

1. DORIDOPSIS RUBRA (Kel. sp.), Ald. & Hanc. Trans. Zool. Soc. v. p. 126, pl. 31. f. 1, 2 (1864).

Doris rubra, Kelaart, Ann. & Mag. Nat. Hist. 3rd ser. iii. p. 298 (1859).
Doriopsis rubra, Bergh.
Hab. Coasts of Madras and Ceylon.

2. D. FUSCA, Ald. & Hanc. *l. c.* p. 126, pl. 31. f. 3.

Doriopsis fusca, Bgh.
Hab. Coast of Madras.

3. D. GEMMACEA, Ald. & Hanc. *l. c.* p. 126, pl. 31. f. 4–7.

Doriopsis fusca, Bgh.
Hab. Coast of Madras.

4. D. CLAVULATA, Ald. & Hanc. *l.c.* p. 127, pl. 31. f. 10–12.

Hab. Coast of Madras.

5. D. TUBERCULOSA (Qu. & G. sp.), Ald. & Hanc.

Doris tuberculosa, Quoy & Gaim. Voy. de l'Astr., Zool. ii. p. 248, pl. 16. f. 1, 2 (1832).
Actinodoris tuberculosa, Gray; *Doriopsis tuberculosa*, Bgh.
Hab. New Guinea and Coromandel coast.

6. D. CARBUNCULOSA.

Doris carbunculosa, Kel. *l. c.* p. 301.
Hab. Ceylon; India; Mauritius.

7. D. PUSTULOSA, Ald. & Hanc. Trans. Zool. Soc. v. p. 128, pl. 31. f. 8, 9.

Doriopsis pustulosa, Bgh.
Hab. Coast of Madras.

8. D. ATROMACULATA, Ald. & Hanc. *l. c.* p. 129, pl. 31. f. 20–24.

Doriopsis atromaculata, Bgh.
Hab. Coast of Madras.

[1] M. Bergh admits forty-four species in his list.

9. DORIDOPSIS PUNCTATA, Ald. & Hanc. *l. c.* p. 129, pl. 31. f. 17.
Doriopsis punctata, Bgh.
Hab. Coast of Madras.

10. D. MINIATA, Ald. & Hanc. *l. c.* p. 130, pl. 31. f. 18, 19.
Hab. Coast of Madras.

11. D. GRANULOSA.
Doriopsis granulosa, Pease, Proc. Zool. Soc. for 1860, p. 32.
Hab. Sandwich Islands.

12. D. SCABRA.
Doriopsis scabra, Pease, Am. Journ. Conch. vi. p. 300, pl. 19. f. 2 *a–c*.
Hab. Tahiti.

13. D. VIRIDIS.
Doriopsis viridis, id. Proc. Zool. Soc. for 1861, p. 241, and Am. J. Conch. vi. pl. 19. f. 1 *a–c*.
Hab. Tahiti.

14. D. NEBULOSA.
Hexabranchus nebulosus, id. Proc. Zool. Soc. for 1860, p. 53.
Doriopsis nebulosa, Bgh. Journ. Mus. Godeff. viii. T. 7. f. 55, and T. 11. f. 24.
Hab. Sandwich Islands.

15. D. AFFINIS.
Doriopsis affinis, Bgh. *l. c.* pp. 84 & 93, T. vii. f. 6–6, T. x. f. 22, and T. xi. f. 2 (1875).
Hab. Tahiti.

16. D. TRISTIS.
Doriopsis tristis, id., Semper, Reis. im Arch. Phil. 2tes Bd. 2ter Th. t. xxxiii. f. 9.
Hab. Philippine Sea.

17. D. RUBRILINEATA.
Doris rubrilineata, Pease, Am. Journ. Conch. vii. i. p. 12, pl. 3. f. 2 *a*, *b* (1871).
Hab. Tahiti.

18. D. NIGRA (Stimps. sp.), Ald. & Hanc. *l. c.* pl. 31. f. 13–16.
Doris nigra, Stimpson, Proc. Phil. Ac. Nat. Sc. vol. vii. p. 380 (1855).
Doris atrata, Kel.; *Doris atroviridis*, id.; *Doriopsis nigra*, Bgh.
Hab. Loochoo Islands; coast of Madras; Ceylon.

19. DORIDOPSIS KREBSII.

Doris (Rhacodoris) krebsii, Mörch, Journ. de Conch. 3e sér. iii. p. 34 (1863).
Doriopsis krebsii, Bgh.
Hab. St. Thomas; Santa Cruz.

20. D. LIMBATA.

Doris limbata, Cuv. Ann. du Mus. iv. p. 468, pl. 74. f. 3, 4 (1804).
D. virescens, Risso; *D. albolimbata*, Rüpp. & Leuck.; ? *D. lugubris*, Gravenhorst; *Dendrodoris limbata*, Gray; *Actinocyclus limbata*, H. & A. Adams; *Doriopsis limbata*, Bgh.
Hab. Mediterranean, Red Sea.

21. D. INDACUS, Tapparone-Canefri, Zool. del viagg. &c., Malacol. p. 114, t. i. f. 16 (1874).
Hab. Yokohama.

22. D. OBSCURA, sp. nov. (Plate XXX. figs. 29, 30).
Hab. ——?

23. D. AUSTRALIENSIS, sp. nov. (Plate XXX. figs. 25, 26.)
Hab. New South Wales.

24. D. AUSTRALIS.
Actinodoris australis, Angas, *l. c.* p. 49, pl. 4. f. 8 (1864).
Doriopsis australis, Bgh.
Hab. New South Wales.

25. D. FUMEA, sp. nov. (Plate XXX. figs. 31, 32.)
Hab. ——?

26. D. FŒDATA, sp. nov. (Plate XXIX. fig. 22.)
Hab. ——?

27. D. INORNATA, sp. nov. (Plate XXX. figs. 33–35.)
Hab. Mediterranean.

28. D. TIGRINA.
Doris tigrina, Audouin, in Savigny's Descr. de l'Égypte, i. pt. iv. p. 13, pl. 1. f. 3 (1809).
D. punctata, Rüpp. & Leuck.; *Doriopsis? punctata*, Bgh.
Hab. Red Sea (Suez).

29. D. GIBBULOSA.
Doriopsis gibbulosa, Bgh. *l. c.* p. 86[1].
Hab. New Caledonia.

30. D. NICOBARICA.
Doriopsis nicobarica[1], id. *l. c.* p. 86.
Hab. Indian Ocean.

[1] No description or figure.

31. DORIDOPSIS SEMPERI.

Doriopsis semperi, Bgh. *l. c.* p.86 ; and in Semper, *l. c.* Heft x. p. 386 (1876).
Hab. Philippine Sea.

32. D. MODESTA.

Doriopsis modesta, id. *l. c.* p. 86 ; and in Semper, *l c.* p. 386.
Hab. Philippine Sea.

33. D. PELLUCIDA.

Doriopsis pellucida, id. *l. c.* p. 86; and in Semper, *l. c.* p. 386.
Hab. Philippine Sea.

34. D. PUDIBUNDA.

Doriopsis pudibunda, id. *l. c.* p. 86 ; and in Semper, *l. c.* p. 387.
Hab. Philippine Sea.

35. D. MACULIGERA.

Doriopsis maculigera, id. *l. c.* p. 86 ; and in Semper, *l. c.* p. 387.
Hab. Philippine Sea.

36. D. DEBILIS.

Doriopsis debilis, Pease, Am. Journ. Couch. vii. 1. p. 11, pl. 5. f. 2, 2 *a* (1871).
Hab. Huaheine.

37. D. COMPTA.

Doriopsis compta, id. *l. c.* p. 12, pl. 4. f. 1.
Hab. Apaiang.

38. D. SORDIDA.

Doriopsis sordida, id. *l. c.* p. 14, pl. 4. f. 2.
Hab. Tahiti.

39. D. FUSCESCENS.

Doriopsis fuscescens, id. *l. c.* p. 14, pl. 4. f. 3.
Hab. Maiao.

40. D. KRUSENSTERNII.

Figured in Krusenstern, Reise um die Welt, Atlas, T. lxxxviii. f. 1–4 (1813).
Actinodoris krusensternii, "Tilesius," Gray.
Hab.

41. D. TILESII.

Figured in Krus. *l. c.* Atlas, T. lxxxviii. f. 5, 6.
Actinodoris tilesii, "Tilesius," Gray.
Hab.

42. D. PARVA, sp. nov. (Plate XXX. figs. 27, 28.)
Hab. ——?

43. DORIDOPSIS VARIATA, sp. nov. (Plate XXIX. figs. 23, 24.)
Hab. Ningpo.

44. D. SUBPELLUCIDA, sp. nov. (Pl. XXX. fig. 36.)
Hab. St. Vincent.

45. D. SPICULATA, Bgh. in Semper, *l. c.* Bd. x. p. 387 (1876).
Hab. Philippine Sea.

46. D. MAMMOSA, sp. nov. (Plate XXIX. figs. 20, 21.)
Hab. ——?

47. D.? sp., Ald. & Hanc. *l. c.* note, p. 115.
Hab. Madeira.

The following are probably *Doridopsidæ*; but the published descriptions are almost too vague to determine with certainty.

48. DORIDOPSIS? MAURITIANA.
Doris mauritiana, Qu. & Gaim. Voy. de l'Astrol., Zool. ii. p. 269, pl. 20. f. 5–8 (1832).
Actinodoris mauritiana, Gray; *Doriopsis mauritiana*, Bgh.
Hab. Mauritius.

49. D.? FUMOSA.
Doris fumosa, Qu. & Gaim. *l. c.* p. 267, pl. 19. f. 14–17.
Actinodoris fumosa, Gray; *Doriopsis fumosa*, Bgh.
Hab. Mauritius.

50. D.? VIOLACEA.
Doris violacea, Qu. & Gaim. *l. c.* p. 264, pl. 19. f. 1–3.
Hab. Australia.

51. D.? DENISONI.
Doris denisoni, Angas, *l. c.* p. 45, pl. 4. f. 2.
Hab. Port Jackson.

52. D.? AUREA.
Doris aurea, Qu. & Gaim. *l. c.* p. 265, pl. 19. f. 4–7.
Hab. Australia.

53. D.? AURITA.
Doris aurita, Gould, Un.-St. Expl. Exp., "Moll. &c." p. 299, pl. 23. f. 394 (1852).
Hab. Feejee Islands.

54. D.? NODULOSA.
Doris nodulosa, Angas, *l. c.* p. 48, pl. 4. f. 6.
Hab. New South Wales.

55. DORIDOPSIS ? CARNEOLA.
Doris carneola, id. *l. c.* p. 48, pl. 4. f. 7.
Hab. Port Jackson.

56. D.? GRISEA.
Doris grisea, Kelaart, Ann. Nat. Hist. 3rd ser. iii. p. 297 (1859).
Hab. Ceylon.

57. D.? SPONGIOSA.
Doris spongiosa, id. *l. c.* p. 302.
Hab. Ceylon.

58. D.? CERISA.
Doris cerisa, id. *l. c.* p. 296.
Hab. Ceylon.

59. D.? SANDIEGENSIS.
Doris (*Actinocyclus*) *sandiegensis*, Cooper, Proc. Cal. Ac. Nat. Sc. ii. p. 204 (1862).
Hab. West coast of North America (Sandiego Bay).

60. D.? VELUTINUS.
Actinocyclus velutinus, Ehrenberg, Symb. Phys. An. evert. excl. Ins.
Hab. Red Sea (Massowah).

61. D.? RUGOSA.
Doris rugosa, Pease, Proc. Zool. Soc. for 1860, p. 31.
Hab. Sandwich Islands.

62. D.? FŒTIDA.
Doris fœtida, id. *l. c.* p. 31.
Hab. Sandwich Islands.

63. D.? RETICULATA.
Doris reticulata, id. *l. c.* p. 26.
Hab. Sandwich Islands.

64. D.? VERRUCOSA.
Actinocyclus verrucosus, Ehr. *l. c.*
Hab. Red Sea.

65. D.? LUGUBRIS.
Doris (*Dendrodoris*) *lugubris*, id. *l. c.*
Hab. Red Sea (Massowah).

66. D.? CUPREA.
Doris (*Dendrodoris*) *cuprea*, id. *l. c.*
Hab. Red Sea (Massowah).

67. D.? GRANULATA.
Doris (*Dendrodoris*) *granulata*, id. *l. c.*
Hab. Red Sea (Massowah).

68. DORIDOPSIS ? DIARDI.

Doris diardi, Kel. *l. c.* iv, p. 267 (1859).
Hab. Ceylon.

69. D. ? ELISABETHINA.

Doris elizabethina, id. *l. c.* p. 267.
Hab. Ceylon.

70. D. ? MARIEI[1].

Doris mariei, Crosse, Journ. de Conch. 3e sér. xv. p. 307, pl. 12. f. 1.
Hab. New Caledonia, Noumea.

71. D. ? ROSSITERI.

Doris rossiteri, id. *l. c.* p. 309, pl. 12. f. 2.
Hab. New Caledonia, Nouméa.

72. D. ? FABREI.

Doris fabrei, id. *l. c.* p. 310, pl. 12. f. 3.
Hab. New Caledonia, Nouméa.

Descriptions of the new Species.[2]

DORIS CORIACEA, sp. nov. (Plate XXVII. figs. 1–4.)

Body much depressed, elliptic. Mantle very large, leathery, the border widely extended all round and subcrenulate; granular above from the presence of numerous close, minute, rounded, subequal tubercles. Rhinophores clavate, with numerous laminæ on the upper half, retractile within deep cavities, the margins of which are raised and denticulate at the edge. Branchiæ 6, tripinnate, set round the long, thin, tubular anus in a cavity having a 6-lobed completely contractile margin. Oral tentacles short and flattened. Foot narrow, with a shallow transverse groove in front, the upper lamina being rather enlarged and divided mesially.

The colour of the spirit specimens is in general brownish fawn, sometimes darker, and occasionally nearly white. On the upper surface irregular patches of minute black speckles are situated epidermically between the granular tubercles. In some specimens these black markings are nearly wanting; in others, they are over the whole

[1] Mr. Crosse gives no account of the oral apparatus of this or of the two following species. He considers that the latter may belong to Mr. Pease's genus *Doriopsis*.

[2] It is just possible that a few of the descriptions which follow may relate to forms already named by other observers. For reasons more than once alluded to, however, it is impossible to be certain of this either way; all that that can be said is, that none of the hitherto published diagnoses can be definitely referred to any of the following animals.

My descriptions would have been more minute had I been able to cut up the specimens: they belong, however, to the collection of the British Museum; and I did not feel justified in making any thing like complete dissections.

surface. Underneath, a close, black, minute freckling is usually found on and near the sides of the foot, but not elsewhere.

In a large spirit specimen the length was 82 millimetres, the breadth 59, the height (or thickness from the middle of the back to the sole of the foot) 15.

Hab. South Africa; Seychelles; Sir C. Hardy's Islands.

The mantle is highly spiculose, the spicula being numerous and close, crossing each other more or less at right angles, nearly straight and cylindrical in form, and with blunt ends. They are rather massed together in bundles.

The odontophore is comparatively small, and bears about 26 transverse rows of numerous small, well-curved, lateral spines.

DORIS INFRAMACULATA, sp. nov. (Plate XXVII. figs. 5–7.)

Body depressed, oblong-elliptic. Mantle leathery, finely granular above, with a wide, irregularly crenulate border. Rhinophores clavate, the apex pointed and bent rather backwards, laminated low down, their cavities with raised crenulate border. Branchiæ 6, tripinnate, spreading: the anus short, with its margin digitate; the general cavity has the edge raised, smooth, or sublobulate. Oral tentacles small, subconical, and grooved above. Foot oblong, truncate in front, rounded behind, with a small transverse anterior groove, having the upper lamina notched.

Colour of the spirit specimens light-brown, with irregular patches of dark-brown situated between the minute granular tubercles of the upper surface, principally upon the mantle-border. Underneath, upon the sides and upon the mantle-expansion, are some large and small chocolate-brown spots.

Length (in spirit) 50 millims., breadth 34.

Hab. Amboina.

The odontophore is proportionally larger than in *D. coriacea*: it bears about 30 transverse rows of lateral recurved spines.

DORIS INFRANÆVATA, sp. nov. (Plate XXVII. fig. 8.)

Body oblong-elliptic, depressed. Mantle widely expanded all round, with a wavy and irregularly crenulate border, covered above with very minute granules. Rhinophores clavate, with the upper half diagonally laminate and conical, the lower rather swollen and marked with transverse striæ, retractile within cavities, with the margin raised, denticulate and contractile. Branchiæ 6, bipinnate; the anus long and tubular; the general cavity with the wall produced, 6-lobed, and completely contractile. Oral tentacles sublinear, flattened, or longitudinally indistinctly grooved on the upperside. Foot oblong, rounded before and behind; transversely grooved, with the upper lamina notched, in front.

Colour (in spirit) light brownish; above, sparingly clouded with epidermic intergranular brown; beneath, with scattered, unequal, dark-brown freckles upon the mantle-expansion all round, near the foot.

Length (of a large specimen in spirit) 42 millims., breadth 28.

Hab. Mediterranean Sea.

DORIS TABULATA, sp. nov. (Plate XXVII. fig. 9.)

Body very flat, oblong, rounded before and behind. Mantle widely expanded all round, the border subcrenulate and rather undulate at the extreme edge, covered above with very minute, close, granular tubercles, the surface being, nevertheless, smooth to the touch. Rhinophores small, close together, retractile into cavities which have the border slightly raised, denticulate and contractile. Branchiæ 6, small, tripinnate, retractile within a cavity protected by six procumbent contractile lobes. Oral tentacles short and subcylindrical. Foot small, very narrow, grooved in front, with the upp lamina notched.

General colour (in spirit) light brown, with a dusky patch on the back and on the sole of the foot; above, on the mantle-expansion, are patches of brown, minute, epidermic, intergranular reticulations.

Length (in spirit) 55 millims., breadth 35, height 7.

Hab. ——?

The mantle-spicules are numerous and close, with blunt ends; some are straight, others more or less bent.

DORIS HEPATICA, sp. nov. (Plate XXVIII. fig. 9, diam. ½.)

Body oval-oblong, rather depressed. Mantle expanded all round, thick and fleshy, with the border irregularly subcrenate and undulating; smooth to the touch, covered above with minute, close, granular, soft, unequal, rounded tubercles. Rhinophores clavate, retractile into wide cavities, with the margins denticulate, although but little raised. Branchiæ 6, tripinnate, rather short, retractile in a cavity with the edge raised and irregularly 6-lobed. Oral tentacles short, flat, subconic in outline. Foot broadest in the middle, about one third the width of the mantle, rounded at both ends, anteriorly grooved, with the upper lamina expanded and widely notched in the centre.

The general tint of the spirit specimen is a dark liver-colour.

Length (in spirit) 90 millims., breadth 5–4.

Hab. Pacific Ocean (Riciniola).

The mantle is well furnished with spicules, which are irregularly cylindrical and with rounded ends; they are of different sizes, but none very large.

DORIS MABILLA, sp. nov. [Bergh *in sched.*]. (Plate XXVIII. figs. 1–4.)

Form depressed, elliptic; mantle large, thick, fleshy, gradually thinning to a subcrenulate edge; raised upon the upper surface into large, irregular, flattened pustules, which, in the larger specimens, become rugose upon the summit. Rhinophores with the upper half diagonally laminated, conical, and bent rather backwards, their pedicels long and somewhat slender; the cavities have the margins raised into subcrenate-edged sheaths. Branchiæ 6, large, tripinnate, spreading, set round the tubular anus in a cavity which has the margin divided into 6 large procumbent lobes. Oral tentacles flat and rather leaf-like. Foot long and narrow, truncated and transversely

slit in front, with the upper lamina enlarged and divided in the middle; rounded behind, and not reaching to the mantle-edge.

Colour (of the spirit specimens) mottled greyish brown above, with the pustules generally much lighter, except on their summits; beneath, the colour is a light grey, shading into brownish towards the margin; a broad irregular band of chocolate-colour, often more or less composed of large confluent blotches, extends all round, except quite posteriorly, on the mantle-expansion, not quite halfway between the foot and the edge. The foot is chocolate-brown, with a lighter band round the border. The large specimens are generally darker.

Length (of an average spirit specimen) 95 millims., breadth 62, breadth of foot 22.

Hab. Seychelles; Samoa.

The mantle-spicules are long and very slender: they are occasionally subnodular towards the ends, which are but little acuminated.

The mouth opens into a large fleshy pharynx, upon each side of which is a rather small chitinous plate, and which becomes inwards rather cartilaginous and longitudinally plicated.

The odontophore is broad, with about 26 transverse rows of numerous lateral spines, which are short, hook-shaped, the base of each being elongated, laterally flattened, and slightly knobbed at the anterior angle.

DORIS SUBTUMIDA, sp. nov. (Plate XXVII. figs. 10, 11.)

Body elliptic, inflated on the back. Mantle large and expanded all round, the border wavy and subcrenulate at the edge, covered above with minute granules. Rhinophores clavate, short, the upper two thirds laminated, the apex somewhat truncated and mucronate; retractile within large cavities, of which the margins are prolonged and lobulate. Branchiæ 6, rather short, tripinnate, set round the short tubular anus, which is just in front of the division between the two hindermost plumes; the general branchial cavity is deep, with the wall produced and lobulate. Oral tentacles long, linear, and grooved above. Foot broadest in the middle, rounded in front and behind, with an anterior transverse groove and notched upper lamina.

Colour of the spirit specimen light brown, covered above (very thickly on the sides) with dark brown epidermic intergranular clouding. The rhinophores and ramifications of the branchiæ are purplish brown. Below, the tint is yellowish, with an orange tinge on the foot, and with scattered unequal purplish-brown spots and freckles all over the pallial expansion, except at the extreme border.

Length (in spirit) 55 millims., breadth 38, height 14.

Hab. Mediterranean Sea.

The spicules are slender, moderate in size, numerous, and close.

DORIS SPECIOSA, sp. nov. (Plate XXVIII. figs 10, 11.)

Body elliptic. Mantle widely expanded all round, leathery, granular above, from the presence of numerous close minute tubercles;

the border crenulate. Rhinophores elongate-conical, upon a contracted base, with minute numerous laminæ extending far down, retractile into deep cavities, which have the openings raised into denticulated sheaths. Branchiæ 7, bipinnate, spreading; along the internal face of each plume lie a central midrib and two lateral longitudinal bordering veins; between these extend delicate upright laminæ, which, towards the free end of the plume, become developed into branches. The anus is short, with the aperture somewhat fimbriate and dentate. The branchial cavity has the border raised and indistinctly lobulate. Oral tentacles short, subconical, and rather grooved above. Foot narrow, widest across the middle, with an anterior transverse groove, the upper lamina of which is deeply notched, a little enlarged, and bearing one or two terminal papiliæ at each side of the notch. The foot becomes acuminated, small, and free behind.

Colour of the spirit specimen light brownish, closely and irregularly blotched with reddish brown on the back, and with darker unequal spots upon the mantle-expansion. Branchiæ and rhinophores light brown. Underneath, the general tint is yellowish brown, with an orange tinge upon the foot, and with a few large unequal round or oval black spots upon the sides of the body and upon the neighbouring portion of the mantle; some smaller spots are upon the sides of the foot.

Length (in spirit) 45 millims., breadth 32, height 10.

Hab. Amboina.

The mantle-spicules are numerous, slender, elongated, cylindrical, and interlacing.

DORIS STRAGULATA, sp. nov. (Plate XXVIII. figs. 7, 8.)

Body oval, convex on the back. Mantle very large, soft, thick, and fleshy, especially on the expanded border, the edge of which is irregularly crenate: it is thickly covered above with small, unequal, rounded tubercles; beneath, it is smooth. The rhinophores are short and clavate, with rounded and somewhat mucronate tips: their cavities have the margins produced into wide tuberculated fleshy sheaths. Branchiæ 6, short, tripinnate, closely embracing the short tubular anus, and retractile into a deep cavity with a 6-lobed margin. Oral tentacles flat, linear, and pointed. Foot comparatively small, oblong, rounded at both ends; anteriorly with a deep transverse slit, having the upper lamina expanded, mesially divided by a large triangular notch, and more or less lobulated. The outline of the lower lamina is rather crenulate.

General colour (in spirit) a mottled grey, lighter upon the mantle-expansion, the darker tint being formed by a minute dotting between the tubercles. The rhinophores are grey, with whitish tips; the branchiæ greenish mottled grey. On the under surface a broad mottled brown band is situated all round between the foot and the mantle-margin. The latter is yellowish, and the wavy line of demarcation is tolerably distinct. The oral tentacles are yellowish, and the foot brown and blotchy except on the edge.

Length (in spirit) 72 millims., breadth 46, height 14; width of mantle-expansion 13 laterally, 22 posteriorly.

Hab. ——?

Mantle-spicules rather small, slender, and spindle-shaped.

DORIS VESTITA, sp. nov. (Plate XXVIII. figs. 5, 6.)

General form elliptic, very convex on the back. Mantle ample, fleshy, widely expanded all round, in broad waves or folds at the border, covered closely on the upper surface with small, elongated, conical or slightly clavate, semitransparent tubercles, which are somewhat larger upon the marginal expansion. Rhinophores clavate, laminated for four fifths of their length, the laminæ being diagonal, about 14 in number, and lying between slight anterior and posterior longitudinal depressions; the apices are truncated, and bear a broad simple terminal style; the cavities into which they are retractile are produced into short tuberculated sheaths with toothed edges. Branchiæ 7, short, broad, tripinnate, not very distinctly separated from each other, and set in a circle, interrupted behind, around a tubular anus: the wall of the cavity into which they are retractile is somewhat raised and irregularly denticulate at the margin[1]. Oral tentacles small, elongated, and conical. Foot about one third as broad as the mantle, rounded in front, with a deep transverse groove, the upper lamina of which is mesially divided; the posterior end is acuminated, and does not extend as far as the mantle-edge.

The general colour of the spirit specimens is a yellowish or light brown, with an orange or pinkish tinge upon the foot.

Length (in spirit) 42 millims., breadth 32, height 15.

Hab. Straits of Magellan.

The pallial spicules are slender, comparatively rather small, tolerably straight, and numerous.

The odontophore is very small: there are about 13 transverse rows of numerous elongated recurved spines, none of them central in position.

DORIS MURREA, sp. nov. (Plate XXVIII. figs. 12–14.)

Body elliptic, oblong, rather convex. Mantle ample, cartilaginous, the border expanded and rather thick; the surface granular and gritty to the touch from the close covering of minute, unequal, rounded, hard tubercles. Rhinophores far forward, small, clavate, the laminæ proceeding from a posterior longitudinal ridge; their cavities are with slightly raised and minutely denticulated margin. Branchiæ 6, slender, bipinnate, set far back, closely around a very small tubular anus, in a deep cavity, which has the margin raised, denticulated, and completely contractile. Oral tentacles small, conical, and pointed. Foot oblong, transversely grooved in front, with the upper lamina rather enlarged and notched.

[1] In one specimen the branchiæ seem to be more numerous in consequence of their indistinct separation and of the prolongation of their lower branches. The sheath of the branchial cavity is also more deeply and distinctly toothed.

Colour (in spirit) white, with an opaque greyish marbling on the upper surface.

Length (in spirit) 36 millims., breadth 20, height 10.

Hab. Mauritius.

The mantle-spicules are small, slightly bent, with the surface a little nodular or rough.

Odontophore broad, with numerous short hook-shaped spines, the bases of which are laterally flattened.

DORIS GRANULOSA, sp. nov. (Plate XXIX. figs. 1–3.)

Body oblong-elliptic, not very depressed. Mantle ample, presenting a granular appearance from a close covering of small, sessile, unequal, rounded tubercles. Rhinophores minutely laminated, rather slender, subconical or pyriform (in one specimen the apices are slightly enlarged and rounded); their cavities are wide, and have the margins produced into short tuberculated and denticulated sheaths. Branchiæ 8, rather short, slender and spreading, bipinnate, surrounding the short tubular anus in a circle interrupted behind; the two hindermost plumes are deeply divided; the margin of their common cavity is nearly smooth. Oral tentacles small, free, flat, and linear. Foot oblong, truncated and transversely grooved in front, with the upper lamina deeply notched, the lower slightly so; the posterior extremity is rounded, and the border flattened.

Length (in spirit) 17 millims., breadth 11.

The colour of the preserved specimens is a dirty yellowish.

Hab. New Zealand.

The mantle-spicules are small, very short, and spindle-shaped.

Odontophore broad, with numerous lateral spines, which are comparatively large and recurved at an angle.

DORIS LONGULA, sp. nov. (Plate XXIX. figs. 4, 5.)

Body oblong, rounded at both ends. Mantle ample, covered with a minute, subequal granulation. Rhinophores short, broad, and apparently conical; their cavities with the apertures simple, and not produced. Branchiæ 12, small, slender, bipinnate, in a complete circle round the tubular anus; retractile in a wide cavity with minutely and irregularly denticulated margin. Oral tentacles small and linear. Foot oblong, rounded at the ends, transversely grooved in front, with both laminæ notched; it reaches behind to the edge of the mantle; and its border is free and flattened.

Length (in spirit) 18 millims., breadth 7.

Colour (in spirit) a dirty cream.

Hab. New Zealand.

DORIS CUCULLATA, sp. nov. (Plate XXIX. figs. 11, 12.)

Body oblong, raised. Mantle widely expanded, somewhat like a hood, over the head; elsewhere with the border but little developed, and not extending down to the foot laterally or posteriorly; it is closely covered with small, subequal, conical tubercles. Rhinophores (their form not determinable in the specimen) retractile within large

deep cavities having the margin produced into short, wide, tuberculated sheaths. Branchiæ plumose, situated in a cavity very far back, their number not determinable in the specimen; but apparently they are not very numerous. Oral tentacles linear, pointed. Foot elongate, nearly as broad as the body, rounded and transversely grooved in front, with the upper lamina raised and notched; acuminated and produced beyond the mantle at the back.

Colour of the spirit specimen light greyish brown, blotched with reddish in front of the rhinophores and near the branchiæ.

Length (in spirit) 21 millims., breadth 8, height 7.

Hab. ——?

DORIS ANALAMPULLA, sp. nov. (Plate XXIX. figs. 8–10.)

Body oval, convex. Mantle large, with a thin wavy border extending all round, closely covered with minute, subequal, rounded, granular tubercles. Rhinophores clavate, with rounded apices and minute diagonal laminæ extending far down; their cavities with the margin raised and tuberculated. Branchiæ 7, small, indistinctly bipinnate, set, at a little distance, around a long, tubular, bottle-shaped anus, which is situated almost in the interval between the two hindermost plumes; the whole retractile in a cavity with slightly raised border. Oral tentacles small, linear, and pointed. Foot elliptic-oblong, rounded before and behind, indistinctly grooved in front, flattened at the border, especially posteriorly, where it is nearly coextensive with the end of the mantle.

Colour (in spirit) semitransparent white, with a yellowish tinge on the back.

Length (in spirit) 15 millims., breadth 10.

Hab. Australian seas.

DORIS LABIFERA, sp. nov. (Plate XXIX. figs. 13, 14.)

Body oblong. Mantle not much extended beyond the foot, but ample in front of the head, covered with close, small, unequal, rounded tubercles, which become smaller upon the border. Rhinophores short, clavate, with a slight longitudinal depression in front, from which the laminæ arise; their cavities with slightly raised tuberculated margins. Branchiæ 6, short, tripinnate, embracing in a complete circle the central short tubular anus; the divisions between the plumes do not extend far down, except in the case of the two hindermost; the cavity into which they are retractile has the margin raised into a short, tuberculated, denticulated sheath. Oral tentacles small, elongate, conical, and pointed. Foot oblong, truncated and transversely grooved in front, with the upper lamina notched; behind, it is narrrower and rounded, and reaches as far as the posterior edge of the mantle; the border is flattened and minutely tuberculated above.

Colour (in spirit) purplish grey, with dark blotches and mottling, produced by a minute purple dotting between the tubercles; the midribs of the branchiæ are violet-grey, from a similar minute freckling; the other parts of the branchiæ and the rhinophores are

yellowish. Beneath, there is a small, unequal, dark freckling, with larger spots upon the foot, and especially upon the upper surface of its border; the ground-colour of the foot is yellowish.

Length (in spirit) 32 millims., breadth 19.

Hab. The Seychelles.

In two of the specimens the mantle is broader, and the spots upon the under surface are larger on the mantle than on the foot; in one of them the tubercles are smaller, more conical, or subclavate, and the rhinophores are more massive, the purple of the branchial midribs is also more decided and not produced solely by a minute freckling; in the other the foot is comparatively very small, and the lateral and posterior border of the mantle is widely expanded and fleshy.

The mantle-spicules are rather small, spindle-shaped, and generally more or less bent.

Odontophore broad, with about 19 rows of numerous, strongly reflected spines, none of them mesially placed.

DORIS LANUGINATA, sp. nov. (Plate XXIX. figs. 15–17.)

Body ovate, rather convex. Mantle large, expanded all round, with a wavy irregularly crenate border; it is covered closely with numerous, small, soft, linear tubercles. Rhinophores clavate, short, thick, truncated at the apices, and with numerous fine lamellæ extending far down; they are retractile within large, wide, denticulated and tuberculated sheaths. Branchiæ 5, short, broad, tripinnate, set deeply in a pallial cavity with raised denticulate margin; the short tubular anus is situated almost between the two posterior plumes. Oral tentacles flat, spatulate, and longitudinally grooved above. Foot oblong, rounded at both ends, with a deep transverse slit in front, the upper lamina divided, and with a short process in the middle; flattened, and with crenulate edge at the sides and posteriorly.

Colour of the spirit specimen dirty greyish brown, mottled with darker, the dark shade prevailing over the upper surface, except on the more central dorsal area. Below, the tint is uniform and lighter, with the exception of a few dark-brown spots; the upper surface of the border of the foot is freckled and sparsely spotted with dark brown.

Length (in spirit) 33 millims., breadth 23, height 13.

Hab. New Zealand.

The mantle-spicules are small, short, and often a little bent.

DORIS COLLATATA, sp. nov. (Plate XXIX. figs. 25, 26.)

Body elliptic, convex on the back. Mantle very large, soft, produced into a thin, wavy, crenulate border, and covered with numerous, small, unequal, rounded tubercles; the under surface is subgranular. Rhinophores short, thick, clavate, rounded at the tips, with numerous fine laminæ reaching down to the short pedicle, and retractile within wide cavities which have the margins produced and denticulated. Branchiæ 8, tripinnate, the lateral ones longest; the two most pos-

terior arise from the bases of the neighbouring plumes; the anus is tubular; the whole system is retractile into a cavity with a thin produced and crenate margin. Oral tentacles small, elongate, conical, and rather flattened. Foot much narrower and smaller than the mantle, truncated and grooved, with the upper lamina enlarged and divided in front.

General colour of the spirit specimens olive, with indistinct brownish patches on the mantle-border and on the foot.

Length (in spirit) 57 millims., breadth 42, height 12; width of lateral mantle-expansion about 16 millims.

Hab. Port Essington.

The mantle-spicules are rather small, spindle-shaped, and interlaced in bundles; they are absent in the extreme border of the mantle.

Odontophore broad, with the numerous lateral spines reflected and bearing one or two small denticulations at the angle.

DORIS MUSCULA, sp. nov. (Plate XXIX. figs. 6, 7.)

Body elliptical, convex. Mantle covering the head and the foot, but not laterally flattened or extended into a border; it is covered above with very small, close, equal, elongated, linear or subclavate tubercles. Rhinophores (not visible in the specimen) retractile into cavities, of which the mouths are produced into short tuberculated sheaths. Branchiæ 9, small, simply pinnate, or bearing lateral laminæ, and compressed; the margin of the cavity into which they are retractile is fringed with small elongated tubercles. Oral tentacles rather flat and linear. Foot oblong, rounded at the ends, with a deep transverse groove in front, the upper lamina being thin and mesially divided; it does not extend behind as far as the mantle-edge.

Colour of the spirit specimen greyish, with a yellowish tinge beneath; on the back is a longitudinal band of faint reddish brown, extending from between the rhinophores nearly as far as the branchiæ, and bordered on each side by an equally broad indistinct blue band, shading into grey on the outer sides; the two latter bands join together between the rhinophores and before the branchiæ. The coloration of these bands is produced by a very minute close freckling between the small tubercles.

Length (in spirit) 13 millims., breadth 9, height 5.

Hab. New Zealand.

DORIS PUSTULATA, sp. nov. (Plate XXIX. figs. 18, 19.)

Body oblong-elliptic, rather convex. Mantle large, extending everywhere beyond the foot, and bearing large, separate, sessile, clavate, flattened, rounded, opaque tubercles, some smaller than others, which become more numerous and smaller upon the border. Rhinophores short, clavate, rounded, retractile through short sheaths which have the margins furnished with three tubercular processes—one on each side, and the third posterior and smaller. Branchiæ 8, small, bipinnate, the two posterior ones bifid, or indistinctly trifid,

set round the tubular anus in a circle interrupted in front as well as at the back; the produced margin of their cavity is covered with small tubercles and is crenulate. Oral tentacles in the form of small, conical, lateral tubercles. Foot small, oblong, transversely slit in front, and with the anterior lamina notched; gradually tapering and rounded behind.

Colour (in spirit) semitransparent yellowish white, with the tubercles opaque.

Length (in spirit) 32 millims., breadth 21, height 12.

Hab. Australian seas.

The mantle-spicules are small, straight, and cylindrical.

DORIS RARIPILOSA, sp. nov. (Plate XXIX. figs. 29, 30.)

General form elliptic-oblong, convex. Mantle ample, soft and membranous on the back, subcartilaginous on the sides, where it is thickened and a little expanded; the border is irregularly and sparingly crenulate; the upper surface bears small, scattered, linear, soft papillæ, which are tolerably numerous on the sides, but are fewer on the back and on the border; between the papillæ are small, short, conical tubercles, becoming rounded on the border, and giving to the latter a granular appearance; the inferior surface is smooth. Rhinophores short, broad, subclavate or conical, pointed, with the numerous small diagonal laminæ reaching far down and extending between slight anterior and posterior ridges; they are retractile into cavities with raised and denticulated margins. Branchiæ 6, short, wide, tripinnate, the main branches deeply divided. The anus is elongated, its base greatly enlarged and its orifice denticulated; the common cavity has the border prominent and indistinctly lobate. Head large; oral tentacles flat, semicrescentic in outline, and pointed forwards and inwards. Foot elongate, but not reaching to the posterior edge of the mantle, much narrower than the latter, truncated, transversely grooved, with the upper lamina widely notched in front, gradually acuminating to a rounded point behind.

Colour of the spirit specimens light dirty brown above, thickly mottled with brownish black on the sides and around the border; the branchiæ are light reddish brown; underneath, the general tint is reddish brown, with a dark minute speckling on the head, on the anterior portion of the mantle, and on the sides of the foot, and with large irregular black blotches, running into one another, on the sides of the body, between the foot and the mantle.

Length (in spirit) 64 millims., breadth 38, height 24.

Hab. —— ?

The mantle-spicules are small, spindle-shaped, and slightly bent or curved.

DORIS MOLLIPUSTULATA, sp. nov. (Plate XXX. figs. 13, 14.)

Body broadly ovate, gently convex, and very soft. Mantle large and pulpy, the border extended at the sides and gradually thinning to a subcrenulate edge; it is covered above with opaque, raised, unequal, soft, pustular surfaces, each of which bears one or more tuber-

cles. (Rhinophores retracted and not visible in the specimen.) Branchiæ 10, small, slender, simple, strap-shaped, pointed, the inner edge serrate; they surround the anal opening, and are completely retractile into a cavity with a contractile orifice. Mouth in the centre of a triangular raised surface, the side angles of which are produced but not free; on each side of the oral opening is a small indistinct tubercle. Foot not quite one third as broad as the mantle, truncated in front, with the margin thin and mesially notched, and rather produced laterally at the angles; it gradually narrows to a rounded point behind, and does not extend beyond the mantle-border.

Colour of the spirit specimen transparent white, with the pustules and the margins of the mantle and foot opaque white; the tubercles are yellowish; the branchiæ yellowish, lineated with white.

Length (in spirit) 12 millims., breadth 10, height 5.

Hab. ——?

In a section of the mantle but one doubtful spicular-looking body was seen.

Doris peculiaris, sp. nov. (Plate XXX. figs. 15–17.)

Body oblong, rounded at both ends, convex, soft. The mantle reaches down over the head and foot all round, but with not much of the border free; it is rather closely covered above with unequal, rotundate, soft, subrugose; flattish tubercles; and underneath it is marked with reticulating raised striæ. Rhinophores oblong, slender, broadest at the apex, rather compressed from before backwards, rounded at the base and marked with minute laminations; they appear to arise from the anterior base of a large, sessile, whitish opaque body, which occupies the floor of the rimmed wide cavity into which the rhinophore is retractile; they are placed well forward and rather close together. Branchiæ 5, wide, deeply divided, and indistinctly tripinnate; they are set in a circle interrupted on the left side; and between the two plumes which bound the hiatus is situated the soft tubular anus; between the latter and the roots of the neighbouring branchiæ extend ridges or laminæ; the whole system is retractile within a circular, rimmed cavity, situated far back. Mouth minute, in the middle of an indistinct, small, triangular, bilobed, raised surface, without tentacular appendages. Foot oblong, broad, nearly coextensive with the mantle, rounded in front and behind, the border flattened all round and notched in front.

General colour of the spirit specimen purplish grey, with the tubercles of a darker and more reddish tint.

Length (in spirit) 26 millims., breadth 13, height 9.

Hab. South Australia (Port Lincoln).

The mantle-spicules are short, mostly spindle-shaped and bent.

Doris prætenera, sp. nov. (Plate XXX. figs. 10–12.)

Body elliptic, broad in the middle, more or less acuminated at the ends, rather convex, soft. Mantle smooth, fleshy, semigelatinous, the border fleshy and not much expanded. Rhinophores clavate, dia-

gonally laminated, and truncated at the apex, retractile, with soft protuberant sheaths situated very far forward and near together. Branchiæ 5, short, tripinnate, the two hinder plumes sometimes double; between the latter is situated the short, broad, tubular anus; the margin of the general cavity is a little raised and smooth. Oral tentacles flattish, grooved above, variable in size, in one specimen rather long and linear. Foot oblong, subtruncate, and without a groove in front, rounded and but little free behind.

Colour of the spirit specimens semitransparent creamy white; the rhinophores smoky, with whitish tips; the branchial pinnulæ blackish.

Length (in spirit) 38 millims., breadth 23, height 13.

Hab. New South Wales.

The mantle seems to be almost devoid of spicules; in one section one or two uncertain elongated bodies were seen.

The mouth opens vertically into a soft conical buccal chamber, which has the wall longitudinally plicated; projecting into the base of this is a large cartilaginous nodular protuberance with an opening in the middle. This probably serves as a kind of prehensile buccal collar; but it is not spiculose. The odontophore is of the typical *Doris* type, broad, the sides bent up and applied together, with about 16 transverse rows of numerous spines. The latter are well developed, long, pointed, and recurved, laterally compressed, with broad bases; none are central in position; but the lateral rows nearly meet in the middle line.

DORIS WELLINGTONENSIS, sp. nov. (Plate XXIX. figs. 27, 28.)

Body oval, convex, swollen. Mantle thick, fleshy, not extended or flattened at the border; covered with large, rounded, flat pustules, between which are scattered small, opaque, whitish tubercular spots. Rhinophores small, clavate, compressed from before backwards, each with more than 26 small laminæ, lying between shallow longitudinal depressions, and extending low down; the apices are styliform, and marked with laminæ, except at the extreme rounded tip; they are retractile through large, wide, fleshy sheaths. Branchiæ 7, ramose, tripinnate, moderate in size, surrounding the tubular anus, which is placed near, and opposite to, the interval between the last two plumes; the whole system is retractile within a large deep cavity, the margin of which is crenulate and wavy, and can be contracted completely over them. Oral tentacles short, thick, tubercular, truncated, and apparently with a central pit on the apex. Foot oblong, broad, fleshy, flatly rounded, and without an anterior groove; posteriorly it is obtusely acuminated.

Colour of the spirit specimen dirty white.

Length (in spirits) 42 millims., breadth 30, height 21.

Hab. New Zealand (Wellington).

The mantle-spicules seem to be absent.

DORIS? DELICATA, sp. nov. (Plate XXX. figs. 20–22.)

Body elliptic-oblong, truncated in front, obtusely and roundly

pointed behind, subprismatic, the dorsal surface flat or but little curved; soft, the sides raised. Mantle small, with the border but little extended and not reaching to the foot, or much over the head, the edge subcrenulate and upturned in parts, especially in front; it is covered above with minute, soft, flattish tubercles. Rhinophores elongate, slender, clavate, pointed, laminated above, inclined laterally, and retractile into cavities with the margins raised into very short, smooth sheaths. Branchiæ 6, small, slender, apparently bipinnate, the two hinder ones bifid; the anus is short and tubular, and placed in front of the interval between the two hindermost plumes; the whole system is retractile within a small marginated branchial cavity, which is situated very far back. Oral tentacles long, linear, and pointed. Mouth subterminal, in the centre of a large rounded tubercle. Foot oblong, narrow, truncated in front, free and roundly pointed behind, but not reaching beyond the mantle-border.

Colour of the spirit specimen transparent yellowish white, with the viscera showing through the back and side in a purplish patch. The mantle-border is marked above with a few greyish pitted spots.

Length (in spirit) 20 millims., breadth 10.

Hab. Chilian coast (Chiloe).

In a small section of the mantle-border no spicules could be distinguished.

CHROMODORIS? MOLLITA, sp. nov. (Plate XXX. figs. 18, 19.)

Body oblong, rounded at both ends, not much compressed, soft. The mantle is expanded into a short, free, wavy sublobate border, rather enlarged posteriorly and over the head; it is nowhere erect. Rhinophores apparently short, thick, clavate, with the upper portion laminate and pointing backwards; their cavities have the openings completely contractile and but barely raised. Branchiæ about 27 in number, irregular, pinnate, some of them divided into two or more branches towards the apex; and the hinder ones are small; they are set upon a rhachis, turning inwards behind, which lies in front and at the sides of the short tubular anus, and are retractile into a cavity with the margin somewhat raised. Mouth subterminal, without tentacles or veil. Foot oblong, truncated, and with a shallow transverse groove in front, rounded, flattened, and extending beyond the mantle-border behind.

Colour of the spirit specimen semitransparent greyish white, mottled with opaque white. The roots and midribs of the branchiæ and the edges of the rhinophore-laminæ are opaque white.

Length (in spirit) 19 millims., breadth 11, height 8.

Hab. ——?

HEXABRANCHUS ORBICULARIS, sp. nov. (Plate XXX. figs. 23, 24.)

Form depressed, outline nearly circular. Mantle expanded all round, except in front, gradually thinning off into a membranous subcrenulate and fimbriate border. Rhinophores small, conical above, laminated and recurved, retractile into narrow cavities with slightly

raised openings. Branchiæ numerous, small, ramose, non-retractile, arranged in 8 bundles at some distance around the thickened, gently protuberant anus. Oral tentacles moderately large, fleshy, flattened, subcordate in outline, with the border multilobulate. Foot broadly rounded and indistinctly grooved in front, narrower and rounded behind.

Colour of the fresh spirit specimen purplish red, mottled with white upon the back, and especially on the sides; at the commencement of the mantle-expansion along each side are about 12 irregular, subrhomboid, white blotches; with the exception of a distinct band of transparent purplish white at the extreme border, the remainder of the expansion is red with darker radiating streaks. The rhinophores are red; the branchiæ white, streaked with red; and the anus is yellow. Underneath, the surface is chiefly mottled with red and white; the sole of the foot is uniform reddish with a yellowish edge; and the margin of the mantle is purplish white.

Length (in spirit) 72 millims., extreme breadth 75.

Hab. Mauritius.

No spicules could be found in the mantle.

HEXABRANCHUS ANEITEUMENSIS, sp. nov.

H. aneitensis, Bergh [in sched.].

Body oblong-ovate, soft, smooth, depressed. Mantle expanded, especially at the sides and behind, with the edge membranous and fimbriate. Rhinophores with the upper part short, thick, conical, laminated, and recurved; the pedicels slender; retractile in smoothly marginated cavities. Branchiæ short, soft, ramose, in 7 irregular bundles at some distance around the wide anus, the opening of which is slightly raised. Oral tentacles flat, fleshy, with deeply and many-lobed border. Foot from one third to one half the breadth of the mantle, transversely grooved in front, the lateral and posterior borders much flattened.

Colour of the spirit specimens, above, mottled red and white, the branchiæ streaked with red; below, the sides and mantle covered with reticulating spotted red markings; the sole of the foot uniform reddish.

Hab. New Hebrides (Aneiteum).

HEXABRANCHUS MAURITIENSIS, sp. nov.

Form elliptic, moderately depressed, smooth. Mantle expanded at the sides, with the border thinning out, subcrenulate and fimbriate, except in front, where it is rather thickened, and very little of it is free. Rhinophores with the upper portion diagonally laminate, conical, rather slender, pointed, and directed backwards; their cavities with short, plain, sheathing margins. Branchiæ in 7 or 8 non-retractile bundles, each containing three or more irregular, short, tripinnate plumes, set round at some distance from the anus. Mouth large; oral tentacles moderate, fleshy, leaf-like lobes, with crenulate edges. Foot long, truncated in front, extending behind nearly as far as the end of the mantle.

Colour of the spirit specimens greyish white, clouded in parts; one example from Rodriguez, probably of the same species, is of a uniform dark grey.

Length (in spirit) of a large specimen 75 millims., breadth 65.

Hab. Mauritius; Rodriguez.

As in all the other species of *Hexabranchus* examined, there are apparently no mantle-spicules.

The mouth is furnished with longitudinally-striated corneous lateral plates. The odontophore is large, with about 30 transverse rows of numerous lateral spines, which are large, upon elongated bases, and not so much recurved as in *H. aneiteumensis*.

ACANTHODORIS MOLLICELLA, sp. nov. (Plate XXX. figs. 1–4.)

Body ovate, convex, soft. Mantle covering the back and sides, but not extending over the border of the foot, bearing above large, long, linear or subconical, soft papillæ, which are especially numerous at the sides and around the branchiæ. Rhinophores long, slender, pointed, apparently conical and laminated far down; the denticulated sheath, through which each is retractile, has two of the antero-lateral divisions enlarged and produced into two long, flat, conical papillæ. Branchiæ 7 to 9, bipinnate, non-retractile, their bases united, and set in a star around the short tubular anal opening. Oral veil short from before backwards, with the lateral ends free and flattened. Foot broad and oblong, truncated (or the outline curving inwards) in front, and without a transverse groove; it is flatly rounded behind; and the border all round is flattened, crenulate, and extending beyond the mantle, particularly posteriorly.

The colour of the spirit specimens is a uniform dark greyish olive.

Length (in spirit) 28 millims., breadth 17, height 11.

Hab. Lord Auckland's Islands.

The mantle-spicules are comparatively few in number, small, spindle-shaped, and some rather bent.

There is a very small spinous prehensile collar, between the laminæ of which project two minute chitinous points (rudimentary lower jaw); its spines are very minute and recurved; their shape could only be made out under a quarter-inch object glass. The odontophore is narrow and strap-shaped, and bears about 14 transverse rows of recurved spines; the two median ones of each row are large, with more or less quadrangular elongated and laterally flattened bases; outside these on each side are about 6 minute rudimentary spines.

ACANTHODORIS GLOBOSA, sp. nov. (Plate XXX. figs. 5–9.)

Body ovate, broad, very convex, and inflated. Mantle membranous on the back and sides, reaching down over the foot, except perhaps quite behind, and bearing scattered, soft, conical, pointed tubercles, which are more numerous towards the border. The rhinophores are apparently rather short and slender, laterally flattened and retractile within sheaths, of which two of the marginal denticulations are enlarged. Branchiæ 7, bi- (? tri-) pinnate, non-

retractile, situated around the anus, far back and low down. Ora veil short, very wavy, the sides prolonged, free, and flattened. Foot broad, truncated in front, with a very indistinct transverse groove; it is rounded behind; and the margin all round is very wavy.

Colour of the spirit specimens transparent white, with a blue coloration on the back and sides; some of the lower tubercles have a reddish or brownish tinge at the base; the rhinophores are faint purplish, becoming lighter at the apex; the branchiæ are variegated with grey. Underneath, the margin of the mantle is marked with fine, close, radiating, reddish-brown-purplish lines; the foot and oral veil are yellowish white.

Length 17 millims., breadth 13, height 12.

Hab. New Zealand.

The spicules of the mantle-border are rather numerous and long, tolerably slender and spindle-shaped; they seem to be arranged radially; in other parts they are smaller and more crooked, and are agglomerated in small scattered bundles.

The buccal apparatus is very small; the buccal collar seems to be very rudimentary, if present at all. The odontophore is narrow, and bears 19 transverse rows, each containing but 2 large spines, and on each side from 4 to about 7 rudimentary conical ones. The base of the large spine appears to be membranous at one part below; it is laterally flattened and subquadrangular.

DORIDOPSIS AUSTRALIENSIS, sp. nov. (Plate XXX. figs. 25, 26.)

Body oblong-elliptic, smooth, soft, and subdepressed; mantle with the margin subcrenulate, rather wavy, and not much extended; Rhinophores small, clavate, pointed, transversely laminated above, and retractile within sheathless cavities. Branchiæ 6, slender, bipinnate, sometimes divided, situated far back, with the protrudent anus between the two hindermost plumes, in a simple-edged mantle-cavity. The suctorial mouth is retractile through an opening in the front border of the foot; and in front of it are two minute triangular lobes. Foot elliptic-oblong, rounded at both ends; anteriorly there is a slight transverse groove, the upper lamina divided by the mouth-opening.

Colour of the spirit specimens semitransparent bluish grey, almost white towards the border and underneath, darker on the dorsal region; the rhinophores are smoky, with white tips; the branchiæ grey.

Length (in spirit) 18 millims., breadth 10.

Hab. New South Wales.

This may be a young form of the animal called *Actinodoris australis* by Mr. Angas (loc. cit.), whose figure, however, represents but 5 branchiæ, and a uniform olive-black colour; the description is too meagre for any accurate determination.

DORIDOPSIS OBSCURA, sp. nov. (Plate XXX. figs. 29, 30.)

Body oblong, rounded at the ends, rather convex; mantle soft, slightly rugose, the boder subcrenulate and but little extended.

Rhinophores clavate, short, stout, with about 19 laminæ, and retractile within unmarginated cavities which are situated close together and very far forward. Branchiæ 8, the last two arising from the bases of their neighbours, short, stout, imperfectly tripinnate, retractile in a common transversely broad cavity, with the short, broad, tubular, triangular anus, which is apparently independently retractile within a small cavity, between the two hindermost plumes. Foot oblong, rounded in front, acuminate behind; anteriorily there is a shallow transverse groove, between the laminæ of which passes centrally the nodular proboscis: both laminæ are notched in the middle; and the anterior one sends a small bilobed expansion round, and in front of, the proboscis: the posterior end of the foot extends rather beyond the mantle.

Colour of the spirit specimens dark bluish grey, closely mottled with black; the extreme margin of the mantle and the border of the foot are yellowish; and the tips of the rhinophores pale grey. Underneath, the mottling is nearly obsolete.

Length (in spirit) nearly 30 millims., breadth 16, height 11.

Hab. ——?

This species is probably closely allied to *D. limbata* of Cuvier.

DORIDOPSIS FUMEA, sp. nov. (Plate XXX. figs. 31, 32.)

Body oblong, rounded at both ends, subdepressed, soft, semitransparent. Mantle semigelatinous, rather puckered above into flat, irregular, indistinct pustules; but very little of the rather fleshy and wavy border is free. Rhinophores short, stout, clavate, slightly kneed in front, the upper portion with diagonal laminæ proceeding from an anterior small longitudinal ridge; the pedicles are marked with annular striæ; they are retractile in cavities with the margins produced into very short, nearly smooth sheaths, situated near together and very far forward. Branchiæ 8, rather slender and short, situated around the anus in a transverse ellipse, interrupted behind; the broad, tubular, fimbriate anus is independently retractile; and the whole system is withdrawable into a fleshy-edged common mantle-cavity, placed very far back. Foot oblong, broad, rounded in front and behind; the anterior border is thickened; and through the centre passes the lenticular proboscis; in front of the latter lies a small bilobed expansion from the foot-border.

Colour of the spirit specimen clear grey, with here and there irregular smoky spots or freckles; a narrow smoky border extends all round next to the greyish-yellow extreme mantle-edge. The rhinophores are smoky, with the tips light; the branchiæ have dark pinnulæ, and a yellowish tinge near the roots; the anterior part of the foot also shows an indistinct yellowish tinge.

Length (in spirit) 40 millims., breadth 22, height 9.

Hab. —?

DORIDOPSIS FŒDATA, sp. nov. (Plate XXIX. fig. 22.)

Body oblong, elliptic, rather convex, with the sides high. Mantle fleshy, soft, minutely and indistinctly tuberculate on the back, much

puckered in the anterior regions, and with the free border very short, rather thick and wavy. Rhinophores apparently short, clavate, somewhat laterally compressed, and laminated far down, retractile in cavities the openings of which are minute and slightly raised, and situated close together and far forwards. Branchiæ 8, short, stout, tripinnate, the last two arising from the stalks of the next plumes; in front of the interval between these two hindermost branchiæ is situated the tubular anus: the common cavity is smoothly rimmed. Foot oblong, broad, rounded in front and behind, the border thick and wavy; there is a shallow transverse groove in front; and through the middle of this is the opening for the proboscis; behind, the foot does not extend beyond the mantle.

Colour of the spirit specimens dirty white, with a few irregular large and small cloudy black blotches, principally on the sides of the back; they are smaller and closer anteriorly. The mantle-border shades into black; and the rhinophores are black; the edges of the branchiæ are smoky, as is the margin of the foot. There are no blotches beneath.

Length (in spirit) 25 millims., breadth 18, height 13.

Hab. ——?

DORIDOPSIS INORNATA, sp. nov. (Plate XXX. figs. 33–35.)

Body ovate-oblong, rather broader behind, convex, soft. Mantle fleshy, with the border small and irregularly crenate. Rhinophores rather short, clavate, kneed in front, somewhat laterally compressed, diagonally laminated, and with rounded apices; the orifices of their cavities are a little raised and contractile; they are situated close together and far forward. Branchiæ 6, rather large, tripinnate, somewhat irregular, and with some of the stalks more or less joined together; the tubular anus is eccentric, a little to the left; the margin of the common cavity is fleshy and slightly lobate. Foot oblong, not very broad, rounded in front, acuminate behind, and not extending beyond the mantle: it is transversely grooved in front, with the upper lamina notched; and immediately above this are two small pits; the opening for the proboscis is in the centre of the groove, which is there enlarged.

Colour of the spirit specimen dirty brownish-white, with the margins of the mantle and foot darker, and with a few small irregular black spots scattered on the back and sides. Rhinophores smoky, with lighter tips.

Length (in spirit) 25 millims., breadth 18, height 10.

Hab. Mediterranean.

The integument is furnished with spicules, which are very minute and blunt; they are scattered, not very closely, just beneath the epidermis. In none of the other *Doridopses* described in this paper could definite spicules be found.

DORIDOPSIS SUBPELLUCIDA, sp. nov. (Plate XXX. fig. 36.)

Body oblong-ovate, broader behind, rather convex. Mantle inflated and transparent on the back, pustulose in front, the border

small, thin, subcrenulate, waved, and transversely striated. Rhinophores apparently short, clavate, laminate and rounded above, retractile within small cavities approximated and far forward in position. Branchiæ 8, small, stout, imperfectly tripinnate, retractile in the deep cavity, the margin of which is irregularly denticulate and completely contractile. Foot short, broad, truncate in front, not extended behind: above the marginal opening for the proboscis are two small tentacular lobes.

Colour of the spirit specimen transparent greyish white, with the branchiæ and the margins of the mouth and of the foot rather darker and more opaque.

Length (in spirit) 21 millims., breadth 14, height 11.

Hab. St. Vincent (West Indies).

DORIDOPSIS MAMMOSA, sp. nov. (Plate XXIX. figs. 20, 21.)

Body broadly elliptic, convex on the back, very soft and gelatinous. Mantle extended all round, semitransparent, and wavy at the border. Along each side of the back is a row of 3 large, conical, elongated, soft processes, now and then bearing a few tubercles near the base, and sometimes rather rugose at the apex; two similar processes are situate between the rhinophores; and smaller soft tubercles are scattered rather irregularly upon the sides and upon the back. Rhinophores clavate and slender, the upper portion diagonally laminated and with rounded tips; retractile in cavities which have the edges raised into short sheaths. Branchiæ 5, large, ramose, tripinnate, set round the anus in a circle interrupted behind; the anus is large, tubular, subpyriform, and is independently retractile within the plumes; the general cavity has the wall fleshy and the orifice irregularly quinquilobate, and sometimes bearing on the lobes indistinct soft tubercles. Foot broad, truncated in front, rounded behind, with the margin, especially at the back, flat and subcrenulate. There is a very indistinct transverse marginal groove in front, through the centre of which passes the short broad proboscis; and in front are two small, free, lateral, flat, rotundate lobes.

Colour of the spirit specimens yellowish white, darker on the margins, on the tubercles, and on the foot; a greyish tinge appears on the large processes from within. On the back, between the processes, is a median longitudinal row of three large, very irregular, lozenge-shaped black markings, containing within each a subcentral large black blotch, as well as one or two short, broad, usually crooked black lines; they are often more or less continuous. Two other rows, each of 5 or 6 similar but smaller markings, the last two always confluent, run, one on each side, from in front of the rhinophores to behind the branchiæ, outside the lateral rows of large processes. The spaces enclosed in these lozenge-shaped markings are always quite smooth. The laminated portion of the rhinophores are opaque yellowish brown, the pedicles light and transparent. The branchiæ have the pinnulæ lineated and tipped with black.

Length (in spirit) 56 millims., breadth 44, height 16.

Hab. ——? (Obtained during the Antarctic Expedition.)

DORIDOPSIS VARIATA, sp. nov. (Plate XXIX. figs. 23, 24.)

Body oblong, raised, soft. Mantle extending down over the foot, but having very little of the border free; in front and at the back the latter is somewhat lobate; the surface is very indistinctly rugose. Rhinophores long, slender, linear, pointed, laminated far down, and laterally compressed; their cavities with marginated edges. Branchiæ 5, very long, slender, tripinnate, diminishing in size from the front one; the tubular anus is independently retractile a little in front of the interval between the two hinder plumes; the general cavity has a quinqui-sublobate edge. Foot oblong, rounded in front, abruptly acuminate behind, and then extending, like a flat oblong tail, beyond the posterior mantle-border. Above the opening for the proboscis in the anterior margin are two short, rounded, lateral tentacular appendages.

Colour of the spirit specimen greyish white, variegated with scattered, dark bluish grey, unequal blotches or spots borne on indistinct flat pustular surfaces; the larger ones are arranged longitudinally with some regularity; on the back moreover is a row of three irregular lozenge-shaped or angular outlines; and along each side is a row of 4 or 5 similar but larger and more distinct markings.

Length (in spirit) 20 millims., breadth 9, height 8.

Hab. China (Ningpo).

DORIDOPSIS PARVA, sp. nov. (Plate XXX. figs. 27, 28.)

Body elliptic, convex, raised at the sides. Mantle soft, smooth, with a very short, free, wavy border; there is a broad interval at the sides between the mantle and the foot. Rhinophores small, clavate, rounded and laminated above; the orifices of their cavities rather protrudent and contractile, placed near together and far forwards. Branchiæ small, apparently bipinnate, and above 7 in number, the two hindermost rather larger and trifid; the margin of their common cavity closes over them. The foot is broad, truncated in front, gradually narrowing, and becoming rounded behind: very little of it is free.

Colour of the spirit specimen semitransparent white, with the border, the branchiæ, the rhinophores, and the foot more opaque.

Length (in spirit) 9 millims., breadth 7, height 6.

Hab. ——?

In conclusion, I wish to record my thanks to Dr. Günther, F.R.S. &c., who has given me facilities for studying these animals, and who has kindly allowed me to make an abstract, in this paper, of the Descriptive Catalogue which I have been preparing for the Natural-History Department of the British Museum.

EXPLANATION OF THE PLATES.

[The mantle-spicules and the spines of the odontophores are as seen under a Smith and Beck's ⅔-inch objective: the other figures, with the exception of *D. hepatica*, are of the natural size.]

PLATE XXVII.

Fig. 1. *Doris coriacea*, dorsal aspect.
2. —— ——, ventral aspect.
3. —— ——, three spines of the odontophore.
4. —— ——, mantle-spicules.
5. —— *inframaculata*, dorsal aspect.
6. —— ——, ventral aspect.
7. —— ——, three spines of odontophore.
8. —— *infranævata*, ventral aspect.
9. —— *tabulata*, dorsal aspect.
10. —— *subtumida*, dorsal aspect.
11. —— ——, anterior part of ventral surface.

PLATE XXVIII.

Fig. 1. *Doris mabilla*, dorsal aspect.
2. —— ——, part of ventral aspect.
3. —— ——, three spines of odontophore.
4. —— ——, mantle-spicules.
5. —— *vestita*, dorso-lateral view.
6. —— ——, ventral view.
7. —— *stragulata*, dorsal aspect.
8. —— ——, ventral aspect.
9. —— *hepatica*, dorsal aspect, ½ diameter.
10. —— *speciosa*, dorsal view.
11. —— ——, ventral view.
12. —— *murrea*, dorsal aspect.
13. —— ——, ventral aspect.
14. —— ——, three spines of odontophore.

PLATE XXIX.

Fig. 1. *Doris granulosa*, dorsal aspect.
2. —— ——, ventral aspect.
3. —— ——, spines of odontophore.
4. —— *longula*, dorsal aspect.
5. —— ——, ventral aspect.
6. —— *muscula*, dorsal aspect.
7. —— ——, ventral aspect.
8. —— *analampulla*, dorsal aspect.
9. —— ——, ventral aspect.
10. —— ——, branchial and anal apparatus, enlarged.
11. —— *cucullata*, dorsal aspect.
12. —— ——, ventral aspect.
13. —— *labifera*, dorsal aspect.
14. —— ——, ventral aspect.
15. —— *lanuginata*, dorso-lateral view.
16. —— ——, anterior view of ventral surface.
17. —— ——, mantle-spicules.
18. —— *pustulata*, latero-dorsal view.
19. —— ——, ventral aspect.
20. *Doridopsis mammosa*, dorsal aspect.
21. —— ——, anterior part of ventral aspect.
22. —— *fœdata*, lateral view.
23. —— *variata*, dorsal aspect.
24. —— ——, ventral aspect.

Fig. 25. *Doris collatata*, dorso-lateral view.
26. —— ——, ventral view.
27. —— *wellingtonensis*, lateral view.
28. —— ——, anterior part of ventral surface.
29. —— *raripilosa*, lateral view.
30. —— ——, ventral view.

PLATE XXX.

Fig. 1. *Acanthodoris mollicella*, lateral view.
2. —— ——, ventral view.
3. —— ——, spines of odontophore.
4. —— ——, mantle-spicules.
5. —— *globosa*, lateral view.
6. —— ——, ventral view.
7. —— ——, spines of odontophore.
8. —— ——, bundle of mantle-spines.
9. —— ——, spines, from border of mantle.
10. *Doris prætenera*, latero-dorsal view.
11. —— ——, ventral view.
12. —— ——, three lingual spines.
13. —— *mollipustulata*, dorsal aspect.
14. —— ——, ventral aspect.
15. —— *peculiaris*, dorsal aspect.
16. —— ——, ventral aspect.
17. —— ——, spicules of mantle.
18. *Chromodoris mollita*, lateral view.
19. —— ——, branchial apparatus, enlarged.
20. *D. delicata*, lateral aspect.
21. —— ——, dorsal aspect.
22. —— ——, ventral aspect.
23. *Hexabranchus orbicularis*, dorsal aspect.
24. —— ——, ventral aspect.
25. *Doridopsis australiensis*, lateral view.
26. —— ——, ventral view.
27. —— *parva*, lateral view.
28. —— ——, ventral view.
29. —— *obscura*, dorsal aspect.
30. —— ——, ventral aspect.
31. —— *fumea*, dorsal aspect.
32. —— ——, ventral aspect.
33. —— *inornata*, lateral aspect.
34. —— ——, ventral aspect.
35. —— ——, mantle-spicules.
36. —— *subpellucida*, lateral view.

March 20, 1877.

Dr. E. Hamilton, V.P., in the Chair.

Mr. Sclater called attention to an article published in the 'Oriental Sporting Magazine' for May 1876 (vol. ix. p. 176), by which it appeared that a two-horned Rhinoceros had been killed in February of that year about twenty miles south of the station of Comillah, in Tipperah, and expressed a hope that Mr. A. Manson, the author of the notice in question, would be induced to send home the skull of the animal (which he appeared to have preserved), in order to enable this part of *Rhinoceros lasiotis* (to which species the specimen

would doubtless belong) to be compared with skulls of *R. sumatrensis*. Mr. Manson had stated that the front horn of his specimen was 8½ inches high, the second merely a stud between the eyes.

Mr. Sclater remarked that this was the third[1] recorded occurrence of a Two-horned Rhinoceros north of the Bay of Bengal.

Mr. Sclater also called attention to the fact that Mr. W. Jamrach had just imported a young living specimen of the Rhinoceros of the Bengal Sunderbans, which was either *Rhinoceros sondaicus* or a very closely allied form[2]. Mr. Sclater had lately examined this animal, which was of the female sex, and measured about 3 feet in height. At this time of life there was certainly no appearance of a horn on the nose.

Mr. Sclater exhibited a small living Amphisbænian (*Blanus cinereus*) which had been accidentally brought to England in the roots of a hot-house plant from Port St. Mary, Spain, and had been presented to the Society by John Goddard, Esq., Elmer Lodge, Beckenham.

The following papers were read:—

1. On the Mammals of Asia Minor. By Charles G. Danford, F.Z.S., and Edward R. Alston, F.L.S., F.Z.S.

[Received February 20, 1877.]

(Plate XXXI.)

The general lack of information as to the fauna of Asia Minor seems to render an apology unnecessary for the introduction of the following very imperfect list of the mammals known to inhabit that country.

In drawing up this catalogue, reference has been made to various notes which have appeared in our 'Proceedings'[3], which relate chiefly to the districts of Trebizond and Erzeroom, and also to a few notices of animals in various books of travels[4], especially in those of Mr. Ainsworth and M. Tchihatcheff. To these are added the animals either observed by Danford, or ascertained by him to occur in the country.

[1] One being that of the specimen of *R. lasiotis* now in the Gardens, and the second that recorded P. Z. S. 1875, p. 566.

[2] See P. Z. S. 1876, p. 751.

[3] E. T. Bennett, "Observations on several Mammalia from Trebizond and Erzeroum," P. Z. S. 1835, pp. 89, 90. E. D. Dickson and H. J. Ross, "Notes accompanying a Collection of Birds (&c.) from Erzeroom," P. Z. S. 1839, pp. 119–123. C. G. Danford, "Notes on the Wild Goat (*Capra ægagrus*, Gm.)," P. Z. S. 1875, pp. 458–468.

[4] Of these we may mention:—Ainsworth, 'Researches in Assyria, Babylonia, and Chaldea' (London, 1838); Spratt and Forbes, 'Travels in Lycia' (Lond. 1847); Baker, 'Lares and Penates' (Lond. 1853); Curzon, 'Armenia' (Lond. 1854); Tchihatcheff, 'Asie Mineure' (Paris, 1856); and Kotschy, 'Reise in d. Cilicischen Taurus' (Gotha, 1858).



J. Smit, lith.

M&N Hanhart imp.

MUS MYSTACINUS



The districts which he had an opportunity of becoming personally acquainted with are as follows:—

1. The neighbourhood of Ismid, at the head of the gulf of the same name.

2. The low country to the south-east of Smyrna nearly to Denizlü, especially the valleys of the Greater and Lesser Meander.

3. The bushy plains at Adalia, and part of the mountainous district of Lycia near that port.

4. The high wooded mountain-ranges of the Bulgar Dagh and Ala Dagh, in the Cilician Taurus.

5. The country which lies between these mountains and the Black Sea, and which, with the exception of a few oak-scrub- and forest-covered ranges near the shores of the latter, consists principally of a barren undulating plateau, having a mean elevation of about 3500 feet.

The time spent in most of these localities was short; and the season of the year at which they were visited was either winter or early spring.

Both these facts argue strongly against the list being at all an exhaustive one, especially as regards the Bats, Insectivores, and Rodents, many more species of which will doubtless be found to inhabit the country. This paper, therefore, must be taken merely as a contribution to our knowledge of the mammalian fauna of Asia Minor.

With regard to the distribution of the species in adjoining countries, we have consulted Geoffroy St.-Hilaire for Greece[1], Kotschy for Cyprus[2], Pallas[3] and Ménétriés[4] for the Caucasus, Canon Tristram for Palestine[5], Mr. Blanford for Persia[6], and Dr. Severtzoff for Turkestan[7].

The species of which specimens were brought home are marked with an asterisk; those of which the evidence of occurrence seems doubtful are not numbered and are enclosed in brackets.

1. *Vesperugo serotinus (Schreber).

Common in the central districts. Some specimens were obtained at the village of Issa-fakyr, near Yuzgat. There is a range of low rocky hills here, on which grows a little oak-scrub, and by the roadside are a few orchards, vineyards, and willow trees.

This was the only Bat obtained, although many other species will doubtless be found to occur.

2. *Crocidura leucodon (Herm.).

Common in the mountains. It has been found in the Caucasus by Eichwald, and in Turkestan by Dr. Severtzoff. According to

[1] Expéd. Scient. en Morée, Zoologie, pp. 10–18.
[2] Unger und Kotschy, Die Insel Cypern, p. 570.
[3] Zoogr. Rosso-Asiat. vol. i.
[4] Catalogue Raisonné, pp. 16–25.
[5] P. Z. S. 1866, pp. 84–93.
[6] Eastern Persia, ii. pp. 18–97.
[7] Turkestanskie Jevotnie (the Mammal portion translated by F. C. Craemers, Ann. & Mag. Nat. Hist. xviii. pp. 40, 168, 208, 325, 377, 1876).

Canon Tristram, the common Shrew of North Palestine is *C. aranea* auct.[1]; and closely allied (if distinct) species have been described from Persia and Georgia.

3. ERINACEUS EUROPÆUS, Linn.?

A Hedgehog which is not uncommon in various parts of the country probably belongs to this species, which is known to inhabit the Lebanon and the Caucasus; but specimens obtained in the Smyrna district on Danford's visit to the country were not preserved.

4. FELIS UNCIA, Schreb. *Kaplan.*

Not common, but generally distributed in the mountains near Smyrna and on those bordering the southern coasts. The Ounce of Asia Minor was specifically separated by Valenciennes under the name of *Felis tulliana*[2], but our friend Mr. D. G. Elliot, who has examined the typical specimens, can find no trustworthy distinctive characters.

This animal, though generally very shy, sometimes shows great daring. On one occasion, after firing several shots at a small herd of Wild Goats, Danford was following up a wounded male, which shortly afterwards fell over a cliff. To reach the spot where he lay, a circuit had to be made, which took not more than ten minutes; but on coming to the place nothing remained but a pool of blood and a few handfuls of hairs; the tracks of two Ounces were easily discernible in the patches of snow; nor did he ever see any thing more either of the Goat or the thieves. The natives both trap and shoot Ounces, and great value is set upon their skins.

5. *FELIS CATUS, Linn. *Yaban kedi* (Wild Cat).

A male and female of this species were obtained among the rocks near Zebil, at an elevation of 3000–4000 feet. The natives say they are not uncommon. Their principal food appears to be a species of Mouse (*Mus mystacinus*, see p. 279), of which no less than fourteen were found in the stomach of one of the Cats trapped. In these skins the ground-colour is of a clearer grey, and the dark markings of the flanks are much more broken up into distinct spots, than in European examples of the species.

[*FELIS LYNX, Linn.

A fine skin obtained in Constantinople, and stated to be from Asia Minor, is nearly uniform light rufous above, with obscure spots on the flanks, and markings on the limbs hardly darker than the colour of the back; the terminal third of the tail is black. It agrees well with Blyth's *F. isabellina*[3] from Tibet; but we do not think that the form is more than a variety of *F. lynx*, which has

[1] *Sorex russulus* (Zimm.), not *S. araneus*, Linn.

[2] Compt. Rend. Ac. Paris, xlii. p. 1035. Figured by Tchihatcheff, As. Min., Zool. pl. i.

[3] Journ. As. Soc. Beng. xvi. pt. ii. p. 1178.

long been known to inhabit the Caucasus, and which Dr. Severtzoff found in Turkestan at a considerable elevation.]

6. *Felis pardina, Temm. *Ushek.*

Rare. A small skin was procured, and a very fine one seen at Kaisariyeh. Canon Tristram has doubtfully referred the *Wushak* of the Arabs of Palestine to this species, which is also said to be common in European Turkey. In Asia Minor it appears to be generally much rarer than the Caracal, although Ainsworth records that no fewer than eight individuals were observed by his party in one day on Tchokúr Ovah, near Missisáh (Missis?).

7. *Felis caracal, Linn. *Kara koulak* (black-ears).

Skins were procured from the neighbourhood of Smyrna, where the Caracal is said to be tolerably common. Of these an adult is much grizzled in colour, owing to the development of the whitish tips of the hairs. Danford also met with it in the Taurus, where, as already observed, it is certainly the commonest species of Lynx.

8. *Hyæna striata, Zimm. *Zyrtlan.*

Not uncommon near Smyrna and in the southern districts. A specimen was procured at the village of Ortakkeui, between Nazlü and the ruins of Hierapolis. Ainsworth mentions that a white variety was observed by the Euphrates Expedition.

[Genetta vulgaris, Less.

The Genet is mentioned by Ainsworth as inhabiting the Taurus. It was not met with by Danford; but specimens taken by Canon Tristram in Palestine are in the British Museum.]

9. *Herpestes ichneumon (Linn.). *Yer kiopek* (earth-dog).

One specimen only of this animal was procured; it was shot among the reeds on a small stream which flows into the Kutchuk Mendere (little Meander), not far from Ephesus. It is no doubt not uncommon in many localities; in Palestine Canon Tristram found it in incredible numbers.

10. *Canis lupus, Linn. *Kurt, Yanovar.*

Generally common throughout the country. The Black Wolf, separated by Schreber as *C. lycaon*, appears to occur in the mountains of the south-eastern districts; for Tchihatcheff saw some skins in the Antitaurus, in the house of a Turkish hunter, who assured him that he had killed the animals himself, and Black Wolves were seen by the Euphrates Expedition on the banks of the Sajúr.

11. *Canis aureus, Linn. *Schakal.*

Generally common, especially in the south.

12. *Canis vulpes, Linn.? *Telki.*

Common in the mountains of the Taurus, and generally distri-

buted throughout the country. It was even met with on the barren plateau of the interior.

An imperfect skin brought home is extremely pale in colour and long in the fur, that of the lower parts being light smoky grey; and these characters were constant in all the individuals which Danford observed. It very much resembles the type of *Vulpes flavescens*, Gray[1], originally stated to be from Persia, with which Canon Tristram doubtfully identified the Fox of Northern Palestine. But Gray subsequently identified his species with Indian specimens, and there appear to be doubts as to the locality of the type[2]. With the imperfect material at our command, we think it safest for the present to regard the Fox of Asia Minor as a pale long-haired race of *C. vulpes*.

13. *Meles taxus (Schreb.). *Porsook.*

Appears to be not uncommon among the mountains. Specimens were obtained at Zebil in the Taurus; the fur of one brought home is as pale-coloured as that of the Persian Badger separated by Mr. Blanford as *M. canescens*[3]. Its skull also agrees with that of his type specimen in having two lateral ridges on the hinder part of the palate; but in other respects it rather resembles European examples, and the last upper molar is even broader than in many of the latter, measuring ·50 × ·58 in. At present, therefore, we cannot help regarding the claim of *M. canescens* to specific distinction with grave suspicion.

"The Ratel" is mentioned by Ainsworth as an inhabitant of the Taurus, and a species of *Ratelus* is said by Schmarda to be found in Mesopotamia; but Mr. Blanford has suggested a possible confusion with the somewhat similarly coloured Badger.

[Ictonyx zorilla (Thunb.).

We introduce this species on the authority of Mr. Keith Abbott, who sent home a specimen which had been forwarded to him alive from the neighbourhood of Erzeroom, where he states it is called *Gheurjen*. Mr. Bennett says that this example scarcely differed from a North-African specimen. As far as we are aware, this is the only record of the existence of the Zorille in Asia Minor; and it has not yet been found in Palestine.]

14. *Martes foina (Linn.). *Samsar.*

Tolerably common among the mountains. The skins are in great request, and cost considerably more than in England. Some specimens were obtained in the Taurus; and Ainsworth mentions it as inhabiting the Chamkú Bel and Karà Bel mountains. His "Sable" is probably either this species or *M. abietum*.

15. *Mustela vulgaris, Linn.

A specimen, shot on the 28th March among the débris of stones

[1] Ann. & Mag. Nat. Hist. xi. (1843), p. 118.
[2] Cat. Carn. &c. Mamm. (1869), p. 203. *Cf.* Blanford *tom. cit.* p. 40.
[3] Ann. & Mag. Nat. Hist. xvi. (1875), p. 310; Eastern Persia, ii. pl. iii.

on a hill-side near Anascha, in the Taurus, at an elevation of about 4000 feet, is pure white, excepting a patch on the top of the head and a few hairs on the extreme tip of the tail. From the surprise evinced by the natives it appeared that such examples are very uncommon; but Ménétriés records that "M. le Docteur Conradi en tua une variété blanche près des eaux du Caucase en janvier." Our specimen is large, with a proportionally long tail, as in the Italian race separated as *M. boccamela*.

[? MUSTELA SARMATICA, Pall.

Ainsworth says that "a *Mustela*, perhaps *M. sarmatica*, is found on the plains;" and Kotschy speaks of having seen "*Viverra sarmatica*," but did not obtain specimens. Danford saw various Weasels without being able to identify them with certainty.]

16. *LUTRA VULGARIS, Erxl. *Su-itti* (water-beast), *Kundush*.

Not uncommon, especially on the trout-streams of the Taurus. Specimens procured on the Cydnus differ in no way from the ordinary English animal, except in being perhaps slightly lighter in colour. In the Caucasus Ménétriés suspected the existence of a second species, of which the fur was said to be lighter in colour and more valuable than that of the Common Otter. The "Grey Beaver, or *Kondooz*," which Mr. Curzon mentions as inhabiting Armenia, is evidently merely the Otter.

17. *URSUS ARCTOS, Linn. *Aiyee*.

Generally common among the mountainous coast-districts, especially in thickly wooded regions bordering on the Black Sea. Great numbers of skins are exported from Ineboli. Not having been able to obtain a specimen on the southern side, we can make no precise statement as to the occurrence of the ordinary Brown Bear in that part of the country. The natives say that there are both brown and grey Bears, the latter being sometimes almost white. One seen near Mersina was very dark in colour; the wetness of the day, however, may have had something to do with this. Should both forms be here found together, there will be strong reason for regarding the following as merely a climatic variety of *U. arctos*.

18. URSUS SYRIACUS, Ehrenb. *Aiyee*.

Common in the south-east. A specimen brought to us at Gozna, near Mersina, which had been shot a few days before our arrival, had the colouring characteristic of the Syrian form.

[PHOCA, sp.?

A Seal observed off the island of Rhodes was doubtless either *P. monachus*, Herm., or *Ph. vitulina*, Linn.]

19. SUS SCROFA, Linn. *Domooz*, *Yaban domooz* (wild pig).

Very common throughout the country wherever a sufficient cover of forest-bush or reed is to be found.

20. *Cervus elaphus, Linn. *Süyün.*

Common in the thickly wooded districts of the north-west. Many stags' heads seen at Ismid near Constantinople appeared all to belong to the usual type of *C. elaphus*. It also occurs on the southern side of the Cilician Taurus, and appears to be more numerous on the Kermesdagh and in the neighbourhood of Marasch. Herr Kotschy alludes to "the yet unknown Stag of the wide Pyramus woods," near which river Danford has been since informed that they are to be met with. Some horns seen at Kaisariyeh, and a pair in our possession alleged to come from the latter districts, are of great size compared with those of animals killed in the north.

21. *Cervus dama, Lana. *Yamoorcha.*

Common on the plains of the south coast and in the lower elevations of the mountains bordering upon them. At Adalia Danford met with the Fallow Deer, among the bushy scrub, within a mile of the town. According to Ainsworth, they are especially common on the Karà Bel and Chamkú Bel Mountains.

22. *Cervus capreolus, Linn. *Karadja.*

Generally distributed in the wooded districts, but more common in the north than in the south. Its existence in the Lebanon has recently been established by Canon Tristram and Professor Newton[1]. The horns seem to correspond with the European form; but the skin appears to differ in the length and texture of the hair, that of a specimen killed in the Cilician Taurus being shorter and finer.

23. Gazella dorcas (Linn.). *Jairan.*

Not uncommon on the plain of Tchukur-ova and about Tarsus and Adana. Ainsworth says that this species is replaced on the Tigris, near Kút Aamárah, by *G. subgutturosa*.

24. *Capra ægagrus, Gmel. *Kayeek.*

Common throughout the Taurus and Armenia, but not found in the west or north of the country, or on the isolated Mount Argæus, near Cæsarea. Its vertical range extends from the mountain-summits to (in some districts) the sea-level. For fuller notes on this species as observed by Danford in Asia Minor see P. Z. S. 1875, pp. 458–468.

25. *Ovis gmelini, Blyth. *Kotch, Yaban köyun* (wild sheep).

Common in many districts of the interior, particularly about the salt lakes in the Vilayet of Konia. It is also found in the elevated plain of Palanga, above Marasch, and thence ranges east and north to Kurdestan and Armenia. It is somewhat remarkable that Danford could find no trace of this animal either in the country to the north of the Ala Dagh or on the wide-reaching grassy plateau between Kaisariyeh and the Black Sea.

It seems hardly ever to occur on the southern slopes of the

[1] P. Z. S. 1876, pp. 420, 701.

Taurus, preferring the barer districts of the north. Herr Kotschy, otherwise so accurate in his observations, must have been misled into stating that ten to twenty Wild Sheep are killed yearly at Gullek, as at that place, which is situated on the south side of the Bulga Dagh, we were assured that the species is not found.

Specimens were obtained from the district of Eregli, where they are common, and frequent the salt-licks in large flocks. Winter is the easiest time of the year to get at them, the deep snow which generally covers that part of the country impeding their movements. At other times they are shy, and, owing to the scarcity of cover, very difficult to approach. The severe winter of 1873–74, which was so fatal to the tame breeds of Sheep, also destroyed a great number of the wild species.

Gmelin's Sheep is a very graceful animal, deer-like in its appearance, having long fine limbs, and in the male a thick bushy throat.

The general colours of specimens procured in the middle of March are:—

♂ 4–5 years old. Head, neck, back, and sides, russet-yellow; belly and underparts of legs white; space before the eye, nose, chin, and undersides of the ears whitish; a dark purple-brown mark above the knee on the fore legs, and a darkish line on the chest; the ridge of the neck and back somewhat darker than the rest of the back; neck thick and bushy.

Total length 53 inches, tail 5 inches, ear 4·25 inches, height at shoulder 33 inches.

♀ 2½ years (by mark of mouth). Colour the same as in the male, but markings less decided. No bushy neck and no horns.

Total length 48 inches, height at shoulder 22·5.

Sir V. Brooke considers that the above-mentioned individuals are not sufficiently old to show the typical markings, specimens which he has received from Ararat being much ruddier and having a white saddle-mark. He also expresses his surprise at the female being without horns.

26. *Sciurus syriacus, Hempr. & Ehr. *Dereek, Kallay.*

Generally common, especially among the oak- and beech-woods of the lower mountains. This Squirrel is very abundant in Northern Palestine; but its range does not appear to extend to the Caucasus, where *S. vulgaris*, Linn., is stated by Eichwald to abound. *S. fulvus*, Blanf., from Persia, is closely allied to the present species.

27. *Spermophilus xanthoprymnus (Bennett).

Exceedingly common through the whole of the steppe country of the interior through which Danford passed, the ground being in some districts perfectly honeycombed with their holes. They have a loud sharp whistle, and are very much on the alert, seldom straying far from their burrows. It is doubtless to this animal that Mr. Curzon refers under the name of "Lemming."

The Souslik of Asia Minor was described by Mr. Bennett under the name of *Citellus xanthoprymnus*, from a specimen sent to this

Society by Mr. Keith E. Abbott from Erzeroom (now in the British Museum)[1]. It was doubtfully referred to *S. musicus* of Ménétriés by Prof. Brandt; and this identification has been generally followed in spite of Brandt's concluding observation:—"*C. xanthoprymnus*, Bennett, vix a *Spermophilo musico* diversus."[2] But the animal, of which we have a good series, proves to be quite distinct both from *S. musicus* and from *S. concolor*, with which Bennett compared it, belonging to the division of the genus with well-haired soles. It is much nearer the European *S. citellus* (Linn.), to which it was referred by Ainsworth, but is at once distinguished by its colour and by the shortness of its tail, which hardly exceeds the hind foot in length. As Bennett gives but a short diagnosis, and the species has since been generally overlooked, we add a fuller description.

Ear rudimentary, soles of hind feet hairy, tail short, hardly longer than the hind foot.

Upper parts nearly uniform reddish buff, most of the hairs slate-grey at the base, then whitish, then broadly tipped with light fulvous; these are mixed with black hairs, which are more numerous in some individuals than in others. Tail cylindrical, unicolorous, more brightly fulvous than the back. A ring round each eye, the edges of the lips, chin, and throat whitish, passing into the pale isabelline of the breast and belly. Legs and feet more distinctly fulvous. Approximate measurements (in skin):—

	inches.
Length of head and body (about)	9·50
„ tail.....	1·40
„ hind foot	1·40

The only recent writer who has recognized the validity of this species is Dr. Severtzoff, who, on his visit to London, identified with *S. xanthoprymnus* certain Sousliks which he had formerly referred to *S. fulvus*, Licht.[3] He says that these specimens were obtained by him near Tashkent and Cheenaz, and by Russoff near Samarkand. If his identification is correct, the range of the species will probably be found to extend through Northern Persia.

[Arctomys, sp.?

Ainsworth states that *A. marmotta* (Linn.) inhabits the Taurus; but *A. bobac*, Schreb., seems more likely to occur there. No Marmot was met with by Danford.]

28. *Myoxus dryas (Schreb.).

A single specimen was procured at Issa-fakyr, in the interior. Its nest was a round ball of dry grass, and was placed in a dense bush of wild rose. It was once or twice disturbed from this retreat, and was eventually secured by firing at the nest. This example is somewhat remarkable in coloration, the whole back from the nape

[1] P. Z. S. 1835, p. 90. [2] Bull. Ac. Petersb. 1844 (ii.) p. 371.
[3] Ann. & Mag. Nat. Hist. 1876, xviii. p. 388.

to the tail being strongly washed with bright rufous. Measurements (in spirits):—

	inches.
Length of head and body	4·25
„ tail	(imperfect.)
„ ear.....	0·45
„ hind foot	0.85

These dimensions considerably exceed those usually quoted; but a specimen of the normal colour in the British Museum (collected by Mlokosievicz in Georgia) is nearly as large. This latter example shows a tendency to yellowish rufous below the ear. Altogether we are inclined to believe that this rare Dormouse will be found to be very variable in colour (as Alston has shown to be the case with *Graphiurus murinus*[1]); and we cannot help feeling very doubtful as to the specific validity of Mr. Blanford's Persian *M. pictus*[2], especially as our Asia-Minor animal has a hind foot proportionally smaller than those of his type specimens.

Ainsworth says that "the Great and Common Dormice" are found in the mountain-forests, probably meaning *M. glis* (Linn.), which is found in the Caucasus and Georgia, and the present species.

[Mus rattus, Linn.

The late Mr. Bennett described a Rat sent by Mr. Keith Abbott from Trebizond, under the name of *M. latipes*[3]. It has been doubtfully referred by Giebel to *M. alexandrinus*, Geoffr.[4]; but Bennett's diagnosis appears to accord best with the common Black Rat, which is known to inhabit the Caucasus and Georgia.]

29. Mus decumanus, Pall.

This species is stated by Ainsworth to be the common Rat of the country.

30. *Mus musculus, Linn. *Sytchan.*

Common in buildings everywhere. One brought home is rather small in size and light in colour, the belly especially being very pale.

31. *Mus sylvaticus, Linn. *Yaban sytchan* (wild mouse).

Probably common. A specimen was caught while running about on the surface of the deep snow, considerably above the tree-growth. Ménétriés obtained this species in the mountains of Talyche, and Canon Tristram on the plains of Palestine.

32. *Mus mystacinus, sp. n. *Dagh sytchan* (mountain-mouse). (Pl. XXXI.)

Ears moderate, nearly naked, when pressed forward they do not reach the eye. Whiskers very long. Tail nearly as long as the head and body, or even longer, sparsely haired except towards the tip. Upper parts mouse-grey, washed with black along the back,

[1] P. Z. S. 1875, p. 317.
[2] Ann. & Mag. Nat. Hist. xvi. (1875) p. 311; East. Persia, ii. pl. iv. fig. 2.
[3] P. Z. S. 1835, p. 89.
[4] Algem. Zool. p. 555.

and passing into fawn-colour on the flanks; behind each ear an oval patch of pure fawn. Snout, lips, lower cheeks, underparts, and feet pure white, the line of demarcation well marked, and the dark colour of the outer side of the limbs not reaching to the carpal and tarsal joints. Whiskers mixed black and white; tail distinctly bi-coloured, dusky above, white below. All the fur dusky at base. Measurements of two adult males (in spirits):—

		inches.	inches.
Length of head and body		4·75	4·45
,,	ear	·60	·60
,,	longest whiskers	2·00	1·70
,,	tail	5·05	4·30
,,	hind foot	1·00	1·00

This Mouse, which we believe to be undescribed, differs from the last species in its shorter naked ears, much larger size, and different coloration. In the latter respect it approaches *M. albipes*, Rüpp., of Abyssinia[1], from which, however, it is at once separated by the differences of its size and proportions. It was common at Zebil, in the Bulgar Dagh, on the rocky bushy hill-sides, at an elevation of 3000–4000 feet. Three specimens preserved are all adult males, and do not differ from one another except in the proportional length of their tails.

Ainsworth says, "The Mouse observed at Bír was an undescribed species;" possibly it may have been the present one.

33. Cricetus frumentarius, Pall.

Herr Kotschy states (*tom. cit.* p. 234) that when he visited the river Cydnus the inhabitants complained of the damage done that year to their grapes by Bears and Hamsters, and that a specimen of the latter which he obtained was identified at Vienna with the European species. It is also included in Ainsworth's list under the name of *C. vulgaris*; but the only Hamster met with by Danford belonged to the next species.

34. *Cricetus nigricans, Brandt.

One of these curious little animals was brought to Danford by his retriever, who was evidently much puzzled as to what he had got hold of. Its cheek-pouches were closely stuffed with some green clover-like food. The locality where it was found was between the villages of Buroon-kysla and Jazli-tash, about the centre of the long stretch of undulating steppe country, covered with dried grass and stones, which lies to the north of Kaisariyeh. The measurements of this example (a female, in spirits) are:—

		inches.
Length of head and body		6·25
,,	tail	·60
,,	ear	·50
,,	hind foot	·70

[1] Mus. Senckenb. iii. p. 107.

This Hamster, which is rare in collections, was discovered in the Caucasus by Ménétriés. It has since been found in Persia by De Filippi, and in Bulgaria by Mr. T. E. Buckley, as recorded by Prof. Newton, who gives a very good figure of the animal [1].

35. CRICETUS ACCEDULA (Pall.).

Examples of this species were sent home by Messrs. Dickson and Ross from Erzeroom, with the observation that the species is there "very common. The eyes are large and black; cheek-pouches spacious, extending from the angles of the mouth to the back of the head, a little beyond the ear. It is one of our domestic mice. In winter it is sometimes found on the snow; its fur is then silky and glossy" [2]. Apparently this is the *Cara-guz* ("black-eyes"), which Mr. Curzon describes as a grey animal, the size and shape of a young Guineapig.

36. *SPALAX TYPHLUS, Pall. *Kior Sytchan* (blind rat).

Common in many places, as has been recorded by Ainsworth and by Dickson and Ross.

[? ALACTAGA DECUMANA (Licht.).

A Jerboa, mentioned by both Herr Kotschy and Mr. Curzon, but not met with by Danford, may probably prove to belong to this species.]

37. *HYSTRIX CRISTATUS, Linn. *Kipri.*

Common in the Taurus, at various elevations, from the plain to 5000 feet. Danford trapped one among the rocks near Zebil, in the Bulgar Dagh, and frequently observed traces of them near Smyrna, and in the island of Rhodes.

38. *LEPUS SYRIACUS, Hempr. & Ehrenb. *Tauochan.*

Common everywhere on the coast districts, but not met with by Danford in the barren interior. It ranges in the Taurus from the sea-level to about 5000 feet. Two specimens shot in the latter district agree well with the original description in the 'Symbolæ Physicæ.' The underwool of the flanks is exactly as there described; but that of the back is pure white, and the fur round the rump is almost pure grey, the hairs being dusky, with white tips, but with no rufous band. These differences appear to us to be probably owing to difference of climate, the specimens having been obtained in winter. According to Canon Tristram, this is the only Hare found in the greater part of Palestine, except in the south and south-east, where it is replaced by *L. sinaiticus*, H. & E., and *L. ægyptiacus*, Geoffr.

[1] P. Z. S. 1870, p. 331, pl. xxvi.
[2] P. Z. S. 1839, p. 122.

2. On the Myriopoda obtained by the Rev. G. Brown in Duke-of-York Island. By Arthur Gardiner Butler, F.L.S., F.Z.S., Assistant, Zoological Department, British Museum.

[Received March 2, 1877.]

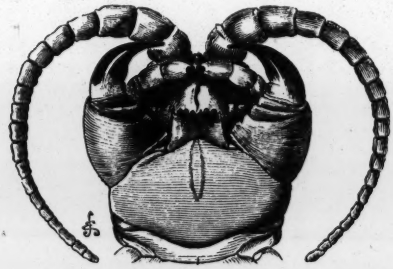
Only two species of Myriopods were sent home, both of them allied to, but distinct from, previously described species.

Chilopoda.

Heterostoma, Newport.

Heterostoma browni, n. sp.

Above brownish olivaceous, with violet reflections, hind borders of the segments dark greenish; antennæ and legs (excepting the femoral and sometimes the tarsal joints of young examples) green; body below testaceous; anal appendices tawny; labial teeth eight, smooth, acutely conical, the central pair on each side very powerful; basilar joint of posterior legs somewhat depressed (not carinated),



Heterostoma browni.

with five short acute spines on the supero-interior margin and six on the inferior surface; lateral anal appendices long (9 millimetres), cylindrical towards the base, acuminate and bidentate at the tip, coarsely punctured, with two minute denticles above near the tip, and two others near the centre of the infero-exterior margin. Length of adult specimen, exclusive of posterior legs, 4 inches; length of posterior legs 1 inch.

Allied to *H. sulcidens* of Newport from Paramatta, but with the segments more parallel, the spines on the posterior pair of legs shorter and placed at more regular intervals from one another, the lateral anal appendices rather longer and considerably less spinose, and with eight instead of six teeth on the lower lip.

CHILOGNATHA.

SPIROBOLUS, Brandt.

SPIROBOLUS CINCTIPES, n. sp.

♀. Reddish tawny, with the hind borders of the segments blackish; legs and antennæ grey, banded with white: a linear impression down the centre of the head; first segment rounded at the lateral angles, with a marginal ridge, not striated; remaining segments with lateral irregular striations; preanal segment subspinose behind, not extending to a level with the extremity of the anal valves; fifty-five dorsal segments; preanal plate subtriangular, compressed; antennæ short, thick, with all the joints excepting the last of nearly equal length, the last joint forming a terminal button; eyes in a rounded subtrianglar mass, blackish, grouped in six rows; 103 pairs of legs; length 3 inches 10 lines.

Allied to *S. gaimardi* of Gervais from New Ireland, but with a greater number of segments and legs, and very different coloration. Several examples of this species were obtained; but, unfortunately, all but one were broken beyond the possibility of rearrangement of the parts: the type, being much larger than the others, and being merely separated in the middle, was easily readjusted.

3. On some Spiders collected by the Rev. George Brown in Duke-of-York Island, New Britain, and New Ireland. By the Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

[Received March 12 1877.]

I am much indebted to the Secretary of the Zoological Society for the opportunity of examining a few Spiders collected, among numerous other natural-history objects, by the Rev. George Brown in Duke-of-York Island, New Britain, and New Ireland. Two of these spiders, an *Argiope* (family *Epeirides*) and a *Sarotes* (family *Thomisides*) appear to me to be undescribed; and upon the former I have taken the liberty to confer Mr. Brown's name. Another of the Spiders, a very distinct and handsome *Gasteracantha* (*G. panisicca*, Butl.), has been already described, but only from dried examples, which must have wholly lost their characteristic colours and markings; I have therefore subjoined a description of its colours and markings from Mr. Brown's specimens. The remaining Spider is one of those gigantic *Nephilæ* (specially characterized by two small tubercular eminences on the middle of the cephalothorax) of the orbicular snares of which most natural-history collectors in exotic regions bring home startling accounts, but of which scarcely any collectors have yet been sufficiently observant to detect the minute males. This, however, is the sex in which the araneologist expects to find the most conclusive specific characters; and, indeed, until the males come to hand, it is often exceedingly difficult to give a reliable opinion upon the specific identity of these and many other Spiders.

Family Epeirides.

Genus Nephila, Leach.

NEPHILA CHRYSOGASTER.

Epeira chrysogaster, Walck. Ins. Apt. ii. p. 92.

Nephila chrysogaster, Cambr. P. Z. S. 1871, p. 620, pl. xlix. figs. 3, 4.

Numerous examples of this enormous Epeirid were contained in Mr. Brown's collections. It is most probably identical with *Aranea maculata*, Fabr. (*A. longipes*, Fabr., and *Nephila maculata*, Leach), as well as with *N. imperialis*, Dol. I have myself received it from several parts of a wide exotic area, including Ceylon, Bombay, Manilla, Labuan, Hongkong, and Celebes; Mr. Brown's examples now add another locality to those already recorded. In all of these localities it appears to be an abundant Spider. I have, however, only as yet received the male from Manilla, Labuan, and Ceylon. This sex is so minute (scarcely measuring more than two lines in length, while the female reaches as much as two inches and even more) and is so unlike the female in form, colours, and structure, that it is probably on these accounts overlooked by collectors who have not had their attention specially called to the fact of this great disparity between the sexes.

Genus Argiope, Sav.

ARGIOPE BROWNII, sp. n.

Adult female, length very nearly 9 lines.

The *cephalothorax* is as long as broad, the thorax nearly round, broader than long; the caput is suddenly and strongly constricted laterally, and projects forward. The upper surface is flat, and its colour is dark brown; the occipital region, that of the four central eyes, and a longitudinal stripe running from them to the occiput are brownish orange-yellow; the sides (towards the margins) are covered with small tubercular granulosities; and the normal converging indentations are covered with light-grey adpressed hairs; the stripes of grey thus formed converge to the thoracic indentation, which is large and deep, and give the cephalothorax a very distinctly radiated appearance. There are other hairs also; but these are the chief.

The *eyes* of the four central and lateral pairs are seated on strong tubercular prominences and (looked at from the front) in a straight line. They are all small and do not differ very much in size; the four central eyes form a quadrangular figure whose fore side is shorter than the hinder one, and its longitudinal considerably longer than its transverse diameter; the interval between the eyes of the fore central pair rather exceeds a diameter; and the height of the clypeus is less than half that of the facial space.

The *legs* are long and tolerably strong, of a dark reddish yellow-brown colour, furnished with hairs, bristles, and spines: the hairs and bristles appear to be most numerous underneath the tibiæ; but

the examples received had been subjected to so much maltreatment that the armature and clothing of the legs were almost destroyed.

The *palpi* are moderate in length and strength, and are apparently similar in colour and armature to the legs.

The *falces* are tolerably long and strong, straight, perpendicular, rounded (in profile) towards their base in front, and similar in colour to the cephalothorax, though perhaps of a rather duller hue.

The *maxillæ* are of normal form, of a deep blackish red-brown colour, with a pale anterior margin.

The *labium* is short, somewhat rounded at the apex, of an orange-yellow colour, paler at the apex, and with a deep reddish-brown patch on each side.

The *sternum* is somewhat heart-shaped and of an orange-yellow colour, clothed with greyish hairs.

The *abdomen* is large, of a rather flattened form, truncated before, broadest across the middle, behind which, on each side, are three largish rounded lobes giving the margins of the hinder extremity a strongly sinuous appearance; the hinder extremity is also lobiform, and beneath it to the spinners, over which it projects considerably, the surface is strongly rugulose. The upperside is dark dull brown thickly covered with rather yellowish or whitish cretaceous spots, as far as the second marginal lobes, behind which the colour is yellowish brown, spotted thinly with pale spots; the posterior half of the abdomen exhibited traces of variously shaped patches (apparently symmetrical in their uninjured state) of white, silky pubescence; the sides are a mixture of yellow-brown, dark brown, and black, spotted with yellowish, as well as with patches and lines of greyish hairs. The underside is deep brown, with a broad yellow marginal band edged outside with a whitish border, which encircles the areas of the spinners, and has two lateral projecting portions on each side between the spinners and the genital aperture; this last consists of two oval openings, one on each side, in front of a largish, transverse, oval, nearly black prominence. The fore half of the upperside has six impressed blackish spots, in three transverse pairs succeeding each other in a longitudinal direction.

The above description has been collected from the fragments of four examples; it cannot, therefore, be looked upon as altogether satisfactory, though there will be found sufficient distinctive specific characters to render the species recognizable. In its perfect state it is probably a very beautiful spider, and is allied to, though quite distinct from the common South-American species *Argiope argentata*, Fabr.

Family Gasteracanthides.

Genus Gasteracantha.

Gasteracantha panisicca.

Gasteracantha panisicca, Butler, Trans. Ent. Soc. Lond. May 1873, p. 162, pl. iv. fig. 14.

Two females of this distinct Spider were contained in Mr. Brown's

legs in colour and armature, and furnished with a scopula beneath the digital joints.

The *falces* are tolerably long and strong, of a darker hue than the cephalothorax, straight but sloping on their inner sides towards the extremity, where they are furnished with long reddish hairs.

The *maxillæ* are rather long and strong, broadest towards their extremity, where they are rounded, straight, but inclined slightly to the labium; they are of a reddish yellow colour, palest at their fore extremity, where they are furnished thickly with a fringe of strong reddish hairs.

The *labium* is of a somewhat oblong form, half the length of the maxillæ, with a convex outer surface and truncated at the apex, its colour being similar to that of the maxillæ.

The *sternum* is heart-shaped, paler-coloured than the labium, and clothed with hairs.

The *abdomen* is oblong-oval, tolerably convex above, rather broad behind, rounded at the posterior extremity, and truncated before; it is clothed with brown, greyish-sandy, and yellow-brown hairs, and is of a foxy yellow-brown colour, margined above with a broad but not very clearly defined dull yellowish border; the greater part of the underside is occupied by a large vase-shaped dark red-brown area, the fore extremity of which has a whitish-yellow border; the spinners are short, those of the superior pair the strongest. The genital aperture is small, much obscured by hairs, but apparently somewhat crescent-shaped.

A single example in the Rev. G. Brown's collection.

4. Notes on the Anatomy of the Musk-Deer (*Moschus moschiferus*). By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received March 3, 1877.]

In the large collection of living animals brought home by the Prince of Wales from India were two male specimens of the Musk-Deer (*Moschus moschiferus*), nearly adult, from Nepaul, presented to His Royal Highness by Sir Jung Bahadoor, whose sudden death has been so recently announced. As far as I am aware, the only other individual of the species which had been seen alive in this country, was the female presented by Sir Richard Pollock, K.C.S.I., on March 31st, 1869, to this Society, which formed the subject of Professor Flower's valuable memoir published in our 'Proceedings' (1875, p. 159).

On Feb. 2nd of this year one of the Prince's specimens died at Sandringham; and His Royal Highness having graciously given permission that a post-mortem might be made upon it, Mr. Clarence Bartlett placed it in my hands.

Pathologically it did not present any features of special interest,

the only organ which gave any proof of lesion being the psalterium, in which several minute abscesses were found along the attached margins of several of the laminæ.

Zoologically the specimen has given me the opportunity of verifying many of the statements both of Pallas in his exhaustive treatise on the animal[1], and of Prof. Flower in his memoir above referred to. My own attention having been much devoted of late to the anatomy of the Ruminantia, I was particularly pleased at having the opportunity of dissecting the species, especially as it was of the male sex, and as Prof. Flower has most kindly allowed me to compare its viscera with those of the female specimen in the Museum of the College of Surgeons.

Considering the various organs seriatim, I found that the tongue greed exactly with that figured by Prof. Flower, as did the epiglottis in being pointed in the middle line, and the stomach in its general configuration.

In the *rumen* the villi were shorter than in most of the Cervidæ and more sparsely scattered. There were no traces of any special glandular pouch on the anterior wall of the viscus.

In the *reticulum* the shallow cells were peculiar in being comparatively small, and more numerous than is generally the case.

The *psalterium* did not differ, except in the number of its lamellæ, from the description given by Pallas; and it appears to me that Prof. Flower, at the same time that he was the first to lay proper stress upon its non-typical nature, hardly read correctly the account given by the earlier observer; for in the College specimen, although the rows of papillæ are particularly feeble, nevertheless it might be said of them "inter majores laminas rugæ intercalares, vel lamellulæ accessoriæ angustiores." In the stomach under consideration they are much more conspicuous. The organ is therefore dupliciplicate, and differs from that of any other Ruminant examined by me, as I have elsewhere shown[2], in that the lamellæ are arranged more closely than is usually the case, and at the same time there is a great deficiency in minor folds, and an excess of those of higher degree.

Pallas counted 23 or 25 major lamellæ in the psalterium of his specimens; Prof. Flower, 19 in his; there were 21 in the specimen now under consideration.

The small intestine was 24 feet 2 inches in length, the large intestine measuring 11 feet 9 inches, and the cæcum $5\frac{1}{2}$ inches. There were three and a half double turns in the colic coil, which is one more than is generally found in larger species, and two more than is frequently observed in smaller ones. Both the cæcum and the colon were curiously mottled from the collection of fat in the course of the vessels traversing their surface, as is mentioned by Pallas, and shown in his figure of the former organ.

With reference to the peculiar dilatation of the colon in the region of the ileo-cæcal valve, this is produced by the considerable development of a glandular surface, which is quite as well marked in the Giraffe (*Camelopardalis giraffa*), as was first pointed out by Dr. T.

[1] Spicilegia Zoologica, fasciculus xiii. (1779). [2] *Antea*, p. 8.

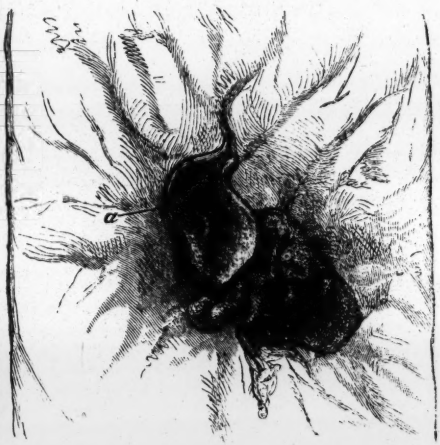
S. Cobbold, in his article "Ruminantia," in the Cyclopædia of Anatomy and Physiology[1], where it is excellently figured, as it is also by the same author, although much less accurately, in the 'Proceedings'[2] of this Society. I take the present opportunity of depicting its condition in *Moschus*, and have had placed side by side with it a drawing of the homologous gland in the Fallow Deer (*Cervus dama*), where it is comparatively smaller (figs. 1, 2). This gland is pro-

Fig. 1.



Ileo-cæcal gland of *Moschus*: *a*, orifice of small intestine.

Fig. 2.



Ilio-cæcal gland of *Cervus dama*: *a*, orifice of small intestine.

bably to be found in other members of the Order; but I regret that till quite recently, not having had my attention specially called to it, I have not taken the opportunity of looking for it. In future I will do so, and will inform the Society of the results of my search[3]. I could find no Peyer's patches.

The liver was more elongate and not so deep as that figured by Prof. Flower. The gall-bladder was lodged in a shallow fossa, its fundus not nearly reaching the free margin of the organ. The caudate lobe was lateral, and far from large. The spigelian lobe was absent—a fact which demonstrates, what specimens of *Cephalophus pygmæus* and *Camelopardalis giraffa* had previously taught me, the

[1] Vol. v. p. 540, fig. 363. [2] P. Z. S. 1860, p. 104, pl. lxviii.

[3] Since this paper was read I have examined the ileo-cæcal region of the colon in *Alces machlis*, where the gland is large and very much like that of the Giraffe—in *Cervus virginianus*, where it is oval, made up of shallow glands, and an inch long—and in *Tragelaphus scriptus* and *Oryx beisa*, where it agrees with that in *C. virginianus*.

variable nature of this small hepatic appendage, even in the same species.

With reference to the generative organs, Pallas records the existence of Cowper's glands and a filiform termination to the urethra, of some length. I take the opportunity of figuring the glans penis, as the drawings given by Pallas, although particularly instructive, are too small to exhibit some of its characteristics (fig. 3). The glans,

Fig. 3.



Glans penis of *Moschus*.

on the whole, is more like that in the genera *Gazella* and *Addax*[1] than in *Ovis*, *Capra*, *Cephalophus*, and *Camelopardalis*, in all of which there is a filiform termination to the urethra. The Cowper's glands were about the size and shape of haricot beans, one on each side. The vesiculæ seminales were each an inch long, and of a fairly uniform breadth of $\frac{1}{4}$ inch. The urethral ends of the vasa deferentia were considerably dilated for a little more than an inch and a half.

As has been clearly described by Pallas, the musk-sac opens a short distance in front of the preputial opening; its size is nearly that of an ordinary orange. In the specimen under consideration it was filled with a dark-brown, chocolate-coloured powder, possessing, most powerfully, the characteristic odour. Its minute orifice was a little more than half an inch in front of the opening of the prepuce, from which latter a few stiff hairs, about half an inch long, projected forwards and downwards. The two orifices were included within a common sphincter muscle, the skin over which was covered with fine hairs, all radiating towards its centre. The slightly convex cutaneous surface included within the sphincter was devoid of hair. This account agrees with that of J. F. Brandt and J. C. T. Ratzeburg in 1839[2]; and my specimen in no way differs from the excellent figures of the musk-sac given by those authors.

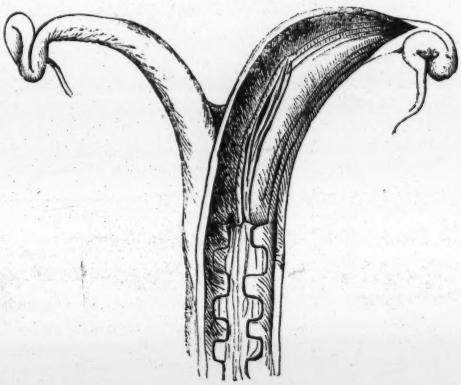
In my paper on the visceral organs of the Ruminantia[3], I have drawn special attention to the nature of the internal surface of the uterus in the Order, having given strong reasons for the surmise that the Cavicornia are characterized by having numerous cotyledons on the placenta, on which account they are termed *Polycotyledontophora*, whilst in the Cervidæ (therefore termed *Oligocotyledontophora*) the cotyledons are very few in number. It occurred to me that the nature of the interior of the uterus or the placenta would throw much light on the very disputed point as to the affinities of *Moschus*. Of the placenta Pallas tells us[4] that "*cotyledones* et respondentes *placentulæ* oblonga, plana figura gaudent et in series fere digeruntur.

[1] *Vide antea*, p. 10, fig. 18.
[2] Medicinische Zoologie (Berlin, 1839), Band i. pp. 41-51, pl. 8.
[3] P. Z. S. *antea*, p. 12.
[4] *Loc. cit.* p. 41.

Extrema secundinarum attenuata, in cornua uteri filo protensa; at versus orificium uteri chorion utriusque anastomosi tubulari cohæret." At the same time he tells us that there were two fœtuses in the uterus.

Prof. Flower has kindly allowed me to examine the uterus of the specimen of *Moschus moschiferus* in the College-of-Surgeons Museum, which was about $2\frac{1}{2}$ years old. From it fig. 4 is taken. It will be

Fig. 4.



Uterus of *Moschus moschiferus*: the left cornu is opened up longitudinally.

seen that there are no cotyledonary papillæ at all, the mucous membrane being disposed in narrow longitudinal folds, six in number, of very little depth, running nearly the whole length of the cornua, slightly broken here and there, but nowhere developing from their free edges the tongue-like processes which form the cotyledonary papillæ in ordinary Deer, or the characteristic linearly arranged elevations of the Bovidæ. This condition differs from any I have seen in other Ruminant animals; and I can find no reference to it by other authors.

I do not think that my account of the organ is at all incompatible with that of Pallas, who has laid special stress on the linear nature of the cotyledons. Neither in the Cervidæ nor the Cavicornia have I ever found an arrangement which can be compared with it. I do not feel justified in regarding it as indicating a nearer relationship to the one than to the other; for the number of the plications is opposed to Cervine affinities, whilst their size militates against their polycotyledonary nature.

When we consider the genus *Moschus* in its relations to the other

Ruminants, it seems to me that to call it a Deer is altogether against the tendency of the facts at our disposal. No known Deer has a gall-bladder, or a filiform termination to its urethra. How can we place with the Cervidæ, therefore, an animal which possesses both?

5. Remarks on the Affinities of *Mesites*. By Edward Bartlett, Esq., Curator of the Maidstone Museum.

[Received March 7, 1877.]

Some months ago I received a small collection of Mammals and Birds obtained on the south-east coast of Madagascar by Mr. Thomas Waters. Among them was a fine pair of specimens of *Mesites variegata*, which are now in the collection of Mr. R. J. Balston. Having examined the two skins of this rare bird very carefully, and not feeling satisfied that the genus has been arranged in its proper group by former systematists, I venture to lay before the Society the following notes, trusting that they may lead to a more careful investigation of the affinities of *Mesites*, and of the position which it should take in a natural classification.

In the Zoological Society's 'Proceedings' for 1861, my father (Mr. A. D. Bartlett) first pointed out the affinities of *Balæniceps*, *Eurypyga*, and *Cancroma*, as evidenced by their "powder-down patches." Now, strange to say, while examining the skins of *Mesites*, I discovered two of these patches very distinct on the back of the neck. This naturally led me to search for others, which, to my surprise, I found—one on each side of the lower part of the rump, close to the tail, one on each side of the upper part of the pectoral muscles, a third pair, one on each side, running across the ribs, on to the pectoral muscle, and a fourth pair, one on each side of the abdominal region, running parallel with the vent, making in all five pairs of powder-down patches. This exceeds the number found in *Cancroma* (which has four pairs) by one pair, the extra pair being those placed across the ribs.

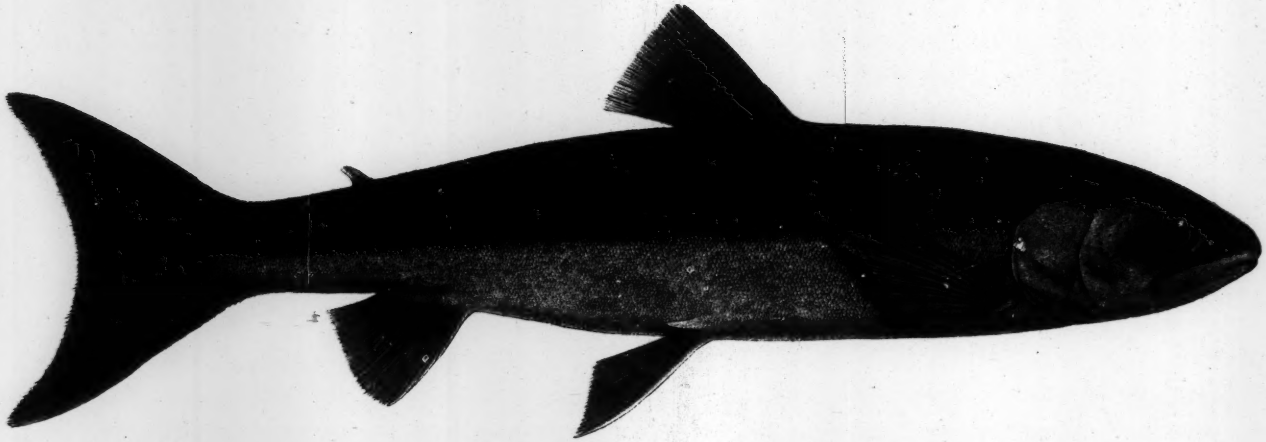
I have examined skins of *Eurypyga helias*, and have found other characters which confirm my opinion that *Mesites* is an aberrant form of the Ardeine group.

The bill is like that of *Eurypyga*, long and slender, the nostrils reaching more than half the length; the wings are rounded; the legs long, slender, and naked above the tarsus. This is the case in *Eurypyga* and all the Herons, although in other respects *Mesites* is very Thrush-like[1].

Another, and one of the most peculiar characters with regard to *Mesites* and *Eurypyga*, is that the quills of the soft feathers on the back and rump are extremely fine and delicate in the centre, which causes the tip of each feather to turn the reverse way directly the

[1] The legs are represented in Gray's 'Genera of Birds' as feathered to the tarsus, which is wrong; in the specimens before me they are naked and scaly ¾ inch up the tibia.





R. Mintern, del.

Mintern. Bros. imp

SALMO ARCTURUS

bird is dead. This fact I have often noticed while preparing the skins of *Eurypyga helias*; and it is exactly the same with the feathers of *Mesites variegata*.

I therefore suggest that the genus *Mesites* should be arranged in the Natural System next to *Eurypyga* and its near ally *Rhinochetus*.

I may add that on examining the powder-down under a glass, I find the structure of that of *Mesites* nearly identical with that of *Ardea cinerea*.

6. Account of the Fishes collected by Capt. Feilden between 78° and 83° N. lat., during the Arctic Expedition 1875–6. By Dr. Albert Günther, F.R.S.

[Received March 20, 1877.]

(Plate XXXII.)

1. Cottus quadricornis, L.

A young specimen, 4 inches long, was found dead by Mr. Egerton on the beach in Dumbell Harbour (lat 82° 30′). No other salt-water fish is known at present to have been found at a higher latitude. In this young specimen the nuchal tubercles are only indicated; but having compared it with a specimen obtained on the English coast, another from Lake Wettern, and with two from Sir J. Richardson's collection (the locality of which is not known, but which most probably were given to him by one of the previous arctic explorers), I have no doubt as to their specific identity. Dr. Lütken has excluded this species from his list of Greenland fishes ('Arctic Manual,' p. 116).

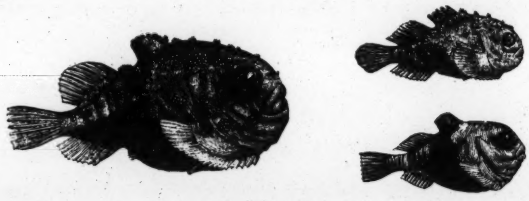
2. Icelus hamatus, Kröyer.

Previously known from Spitzbergen and Greenland, seems to be one of the most common fishes in the latitudes between 80° and 82°. Two specimens were obtained at Discovery Bay (81° 44′), three at Franklin-Pierce Bay (in 15 fathoms), and seven at Cape Napoleon. All these specimens were caught in the month of August, and were ready for spawning.

3. Cyclopterus spinosus, Müll.

Previously known from Iceland, Spitzbergen, and Greenland. Two specimens from Cape Napoleon, and four from Franklin-Pierce Bay are all young, and interesting as showing the irregular manner in which the conical spines are developed. The largest of these young specimens is not quite 2 inches long; and the tubercles are much less numerous than in an adult specimen; it is rough, and covered with minute spines. In a specimen 15 lines long only traces of the tubercles are visible on the skin. A specimen 12 lines long is quite naked, whilst another of the same size has the tubercles as much de-

veloped as the largest, or even more so. The spines of the first dorsal fin are sometimes quite distinct, sometimes enveloped in loose skin.



Cyclopterus spinosus.

4. Liparis fabricii, Kröyer.

Previously known from Spitzbergen, Greenland, Fort Leopold; is represented in the present collection by a specimen from Discovery Bay, and another from Franklin-Pierce Bay.

5. Gymnelis viridis, Fabr.

One specimen, obtained in lat. 81° 52′; it is only 5 inches long, and belongs to a highly coloured variety, being brown with numerous white spots, and having four black ocelli on the dorsal fin.

6. Gadus fabricii, Rich.

Widely distributed in the arctic regions of the western hemisphere. One specimen, obtained off Cape Hayes, Grinnell Land.

7. Salmo arcturus, sp. n. (Plate XXXII.)

The northernmost Salmonoid known at present.

This Charr cannot be identified with any of the other races of this division of *Salmo*; it comes nearest to the Charr of Killin (Inverness-shire), but differs from it in having a more slender body, rather smaller scales, shorter fins, and a less number of pyloric appendages.

Body rather elongate; head small, two ninths or nearly one fifth of the total length (without caudal), scarcely more than one half of the distance between the snout and the vertical from the origin of the dorsal fin. The snout is remarkably obtuse; the maxillary varies in length: in males of the same size it sometimes reaches scarcely to, sometimes a little behind, the hind margin of the orbit; in the female it is smaller and shorter. Teeth small; vomerine teeth limited to the anterior extremity of the bone; a band of villiform teeth along the middle of the hyoid bone. Præoperculum with a distinct lower limb; suboperculum about twice as long as deep; pectoral but little shorter than the head, exceeding in length one half of the distance of its root from the ventral. Ventral terminating at a considerable distance from the vent. D. 13, the longest ray as long as the head (without snout). A. 12. Caudal moderately excised, its middle rays half the length of the outer ones. Scales minute. Branchiostegals 11.

Upper parts of a dull brownish green, passing on the sides into the silvery or reddish colour of the lower parts. Dorsal and caudal



J.G.Keulemans lith

M&N Hanhart imp

1. ZOSTEROPS ANJUANENSIS.
2. TCHITREA VULPINA.





Keulemans lith. M & N Hanhart imp.

TURDUS BEWSHERI.

of the colour of the back; paired fins and anal yellowish. No dots or ocelli. Young with numerous parr-marks.

The number of pyloric appendages were found to vary; one male has 31, another 35, a third 44, and a female 42.

Several specimens were obtained on Victoria Lake (lat. 82° 34′), and in freshwater pools of Floe-berg Beach (lat. 82° 28′). Dr. E. Moss kindly communicated to me a coloured sketch of a specimen caught in North-Ravine Lake. Specimens 12 inches in length are full-grown; no larger ones were found. The ovaries and testicles in specimens caught in the month of August show the commencement of seasonal development.

Note.—It may be mentioned here that, of the collections made during the visit of H.M.S. 'Valorous,' the following species from the Greenland coast have been sent to the British Museum:—

Cottus grönlandicus, C. V., young; *Cottus tricuspis*, C. V., young; *Centronotus fasciatus*, Bl., young; *Stichæus punctatus*, Fabr. These were obtained at Godhavn Harbour.

Aspidophoroides monopterygius, Bl., young, obtained at a depth of 30 fathoms in lat. 65°, long 53°.

These fishes are well-known inhabitants of the coasts of South Greenland.

7. On a Collection of Birds from the Island of Anjuan. By Edward Newton, M.A., C.M.G., Colonial Secretary of Mauritius, F.L.S., C.M.Z.S.

[Received March 20, 1877.]

(Plates XXXIII., XXXIV.)

My friend Mr. C. E. Bewsher, of Mauritius, last autumn had the opportunity of paying a visit to the little-known island of Anjuan[1] or Joanna, one of the Comoro group, and while there was most hospitably entertained by the Sultan, and by Mr. Sunley, an English sugar-planter of some long residence there, whose kindness to the officers of Her Majesty's fleet when visiting this remote spot is well known and appreciated in the navy.

Mr. Bewsher remained in Anjuan seven weeks, and during that time made a large collection of mammals, birds, reptiles, shells, ferns and other plants.

The first two Mr. Bewsher has kindly forwarded to me; and the birds I lay before the Society this evening, with a few remarks concerning each. The collection is not only most interesting, but is also in very excellent condition.

Members will recollect that Mr. Sclater gave an instructive account of these islands in 'The Ibis' for 1864, p. 292, and appended a list

[1] "Anjouan, dont le véritable nom, suivant l'autorité du savant William Jones, est *Hinzouân*, écrit aussi *Anzuame*, *Anzouan*, *Juanny*, a fini même, sous l'influence d'idées chrétiennes, par s'appeler *Johanna*."—Oscar Maccarthy, in 'L'Univers:' les îles d'Afrique, pt. iii. § iii.; les îles Arabes, p. 125 (Paris: 1848).

of twenty-three species of birds, chiefly collected by Drs. Kirk and Dickinson, as occurring in one or other of them. Since that time about fifteen more have been added to our knowledge by the Dutch naturalists and travellers MM. Pollen and Van Dam.

The present collection contains twenty-seven species, of which nineteen have been before known to occur in the group, and eight are new to the fauna, including five which have not hitherto been described. The total number of the species of the Comoro Islands is therefore now raised to forty-six; of these, three (or perhaps four) appear to me likely to have been introduced.

Of the new species the most interesting is a true *Turdus*, no bird of this genus having been previously discovered in any of the Mascarene Islands or in Madagascar itself. Several of the other species are so nearly identical with those found in Madagascar that I have not ventured to describe them as distinct; yet they have well-marked features which make them easily recognizable from the former, either by length of feather, general colour, or size of beak.

1. ACCIPITER PUSILLUS.

Scelospizias pusillus, Gurney, Ibis, 1875, p. 358.
Accipiter francesi, Sclater, Ibis, 1864, p. 298, pl. vii. (nec A. Smith).
Nisus francesii (pt.), Schlegel & Pollen, Rech. Madag. p. 36.

Three specimens, one male and two females.

"Only saw two pair; found one egg in a female, sent herewith. Iris yellow or orange, beak bluish grey, legs and feet light yellow." Native name "Shimpangar."

I have already a specimen of this species, apparently a male, which was given to me by Dr. Playfair, R.N., of H.M.S. 'Orestes,' having been shot at Pomony, Anjuan, November 16th, 1863.

2. MILVUS ÆGYPTIUS.

Milvus ægyptius, Sclater, Ibis, 1864, p. 298; Schlegel & Pollen, Rech. Madag. p. 44.

Five specimens. "Very common." Native name "Coosee."

3. ALUCO FLAMMEUS.

Three specimens. "Three only seen and shot." Native name "Boondee."

4. CORACOPSIS COMORENSIS.

Coracopsis comorensis, Peters, Monatsb. Akad. Wissensch. Berlin, 1854, p. 371; Hartl. Madag. p. 59; Sclater, Ibis, 1864, p. 300.

Three specimens. "Very common in high forests, where it lives on tops of trees."

5. CORACOPSIS BARKLYI.

Coracopsis barklyi, E. Newton, Proc. Zool. Soc. 1867, p. 346, pl. xxii.; Ibis, 1867, p. 341.

One specimen. "The only one I saw."

This bird appears to me to be identical with *C. barklyi*, which has hitherto been found in the Seychelles group only. As the Parrots

of this subregion are extremely local, I am led to the belief that this bird must have been introduced into Anjuan from the Seychelles, where it is not unfrequently kept as a cage-bird; and as I know several of the creoles of the Seychelles are employed in Anjuan, it is likely that it may have been brought over from there, escaped, and been shot by Mr. Bewsher. It was the only one he saw. The wing-feathers are much broken at the extremities, as if the bird had been kept in confinement.

6. CORYTHORNIS VINTSIOIDES.

Six specimens. "Most common on streams near the sea." Native name "Mouam Moran."

The specimens of this species are almost identical with those from Madagascar; but the blue on the back and rump in the former is lighter than in the latter.

7. MEROPS SUPERCILIOSUS.

Six specimens. "Not common; seen chiefly in small trees, on bare twigs, near the shore; crop full of black mason flies; generally in small flocks of six or eight." Native name "Cimbangoolee."

This bird is so nearly identical with specimens from Madagascar that I have not thought proper to describe it as a distinct species; but all the specimens from Anjuan have the crown of the head less brown and the middle tail-feathers less elongated than those from Madagascar.

8. NECTARINIA COMORENSIS.

Nectarinia comorensis, Peters, Ibis, 1864, p. 299.

Six specimens. "Very common." Native name "Shetozee."

The nest is similar to those of others of the genus. The egg is greyish white, spotted and blotched, especially at the larger end, with ashy brown.

9. ZOSTEROPS ANJUANENSIS, sp. n. (Plate XXXIII. fig. 1.)

Zosterops Z. poliogastræ (Heuglin, Ibis, 1861, p. 357, pl. xiii.) *simillima, sed sine lineâ flavâ postoculari, epigastrio obsoletè cinereo, abdomine albo.*

Long. tota 4·3, alæ 2·2, caudæ 1·6, acrotarsi ·7, dig. med. sine ungue ·35, hallucis sine ungue ·27, maxillæ a fronte ·45, mandibulæ ab articulo 1·1 poll. Angl.

Five specimens, four male and one female. "Nest and eggs sent; sits very close; not very common." Native name "Nean Teughnan."

This handsome species most nearly resembles *Z. poliogastra* of Von Heuglin, from Abyssinia. There is, however, a spot of yellow on the lores instead of a streak of yellow extending over the eyes; the yellow on the throat extends somewhat lower down than in *Z. poliogastra*; the chest only is grey, while the belly is of a dirty white, instead of both being grey as in the African species. The nest and one egg sent resemble those of all the others of the genus with which I am acquainted.

10. DICRURUS FORFICATUS.

Dicrurus forficatus, Sclater, Ibis, 1864, p. 299.

Eight specimens. "A very sharp, clever bird, the only bird

whose habits I was able to study, having had five or six brought to me alive; but I only managed to keep them for a few days. They are very pugnacious, attacking crows and hawks, and even beating them off. They sing very sweetly and softly, and seem to be able to imitate other birds. They live on grasshoppers. On presenting a large grasshopper at the wires of the cage it is immediately seized by the beak; the bird then grasps it with its foot, and settles on the perch. Then at once the bird makes a jump in the air, and alights with one of the springing legs of the creature free from its grasp; this it tears off, and then repeats the same movement, tearing off the other leg; then, still holding the wings grasped to the body, the bird pulls off the head and swallows it. Afterwards it tears off the wings one by one, making a jump round off the perch, and freeing one wing from its grasp in each jump, as it did with the legs before described. The body is then well masticated, and swallowed whole. They generally ate two large locusts at a time. They were not common." Native name "Maremondou."

These specimens differ somewhat from those of Madagascar in having more robust beaks and the crest on the head more full; but the differences are so slight that I do not feel justified in describing them as belonging to a distinct species. It is to be remarked that the collection does not contain a specimen of *D. waldeni*, which was found at Mayotte by MM. Pollen and Van Dam; and the description which these gentlemen give of the habits of this species is so unlike what has been described of the habits of other birds of this genus, and so like those of the allied genus *Tchitrea*, that I am almost led to suppose that they must have really described a bird more nearly resembling *Tchitrea corvina* of the Seychelles.

11. TCHITREA VULPINA, sp. nov. (Plate XXXIII. fig. 2.)

T. mutatæ (*in vestitu rubido*) *admodum similis, sed colore pallidiore et magis aurantiaco, maculâ alari latiore, et caudâ breviore et concolori diversa.*

Long. tota 11, alæ 3·1, caudæ 7·7, acrotarsi ·7, dig. med. sine ungue ·4, hallucis sine ungue ·3, maxillæ a fronte ·75, mandibulæ ab articulo 1·2 poll. Angl.

Six specimens, four male and two female. "A beautiful bird, not common; tail of male much longer than that of female; nest and eggs sent." Native name "Mouchtata."

These birds differ considerably from *Tchitrea mutata* of Madagascar and *T. pretiosa* of Mayotte. Though they were obtained in the height of the breeding-season, there is no trace among them of the black-and-white form which occurs so frequently in the adult Madagascar species, and the elongated tail-feathers of the male birds are of a uniform cinnamon-colour, and not black and white as they always are in their relations. The cinnamon-colour also is much lighter, the elongated tail-feathers and the wings much shorter than in the Madagascar species; the white on the wings is much more conspicuous, and the edging to the primaries and secondaries more pronounced. Taking these differences into consideration, I have but little hesitation in describing the Anjuan bird as a new species. The

nest and eggs are very similar to those of others of the genus: the eggs are creamy white, spotted with light red and ash-colour, chiefly at the longer end, and measure ·72 by ·57 inch.

12. ELLISIA LONGICAUDATA, sp. n.

Ellisia E. typicæ *similis sed obscurior, rostro caudâque longioribus.*

Long. tot. 7, alæ 2·5, caudæ 3·25, acrotarsi 1, dig. med. sine ungue ·55, hallucis sine ungue 4, maxillæ a fronte ·65, mandibulæ ab articulo 1·35 poll. Angl.

Four specimens. "Only seen after 1000 feet up in low bushes and thick wood. Jerks its tail up when singing." Native name "Dhadhacolee."

These specimens are very like those of *Ellisia typica* from Madagascar; but in all of the former the beak is a trifle, and the tail half an inch longer than in the latter.

13. HYPSIPETES OUROVANG.

Hypsipetes ourovang, Sclater, Ibis, 1864, p. 298; Schlegel & Pollen, Rech. Madag. p. 96.

Six specimens. "Very common; nest and eggs sent." Native name "Soaly."

These specimens do not differ in the smallest degree from those of Madagascar.

14. TURDUS BEWSHERI, sp. n. (Plate XXXIV.)

Turdus *suprà saturatè olivaceo-brunneus, guld albidâ brunneo-striatâ, torque pectorali brunneo, abdomine albo brunneo squamato.*

Long. tota 8·3, alæ 4, caudæ 3·2, acrotarsi 1·5, dig. med. sine ungue ·8, hallucis sine ungue ·5, maxillæ a fronte ·9, mandibulæ ab articulo 1·7 poll. Angl.

Three specimens, two male and one female. "Only saw five or six; a stupid-looking bird, sitting in a moping way on the trees; quick flight in forest." Native name "Bhambee."

In general coloration this bird closely resembles *Zoothera monticola* of the Himalayas. This interesting species I propose to call after its discoverer, Mr. Bewsher.

15. CORVUS MADAGASCARIENSIS.

Corvus scapulatus, Schlegel & Pollen, Rech. Madag. p. 102.

Three specimens. "Very common." Native name "Quihe."

16. SPERMESTES CUCULLATUS.

Three specimens. "On high lands in flocks; common; nest and eggs sent." Native name "Nean Saughan."

On comparison these specimens appear to be identical with Swainson's type of the species in the Cambridge Museum. It is widely distributed in Africa, being found on the east and west coasts; but I should be inclined to think it has been introduced into Anjuan. The eggs are white, and measure ·55 by ·42; the nest is, like those of many of the genera, entirely composed of the almost ripe stalks of grass, with the seed still on them, and is a domed structure.

17. Foudia algondæ.

? *Foudia madagascariensis*, Sclater, Ibis, 1864, p. 299 (nec Linn.).
Ploceus algondæ, Pollen, Rech. Madag. p. 109, pl. 34.
Calyphantria comorensis, Cabanis in Von der Decken's Reise, iii. p. 31, tab x. (named *Foudia comorensis* on plate).

Seven specimens. "Not common." Native name "Paramoran." The egg, light blue, measures ·84 by ·6.

This species very closely resembles *F. sechellarum* in size and shape, though its beak is still stouter than in that species. The series of specimens received from Mr. Bewsher show that no specific distinction between *F. algondæ* and *F. comorensis* can be established.

18. Columba polleni.

Columba polleni, Schlegel, N. T. D. vol. iii. p. 87; Schlegel & Pollen, Rech. Madag. p. 112, pl. 35.

One specimen, female. "Only specimen I obtained; was brought to me; never saw one alive." Native name "Moniun Kungha." "Beak and feet yellow, iris yellow."

19. Turtur comorensis, sp. n.

Turtur picturatus (pt.), Schlegel and Pollen, Rech. Madag. p. 113.

Turtur T. picturato *simillimus, sed alâ longiore, et capite uropygioque dorso fere concoloribus.*

Long. tota 12·5, alæ 6·5, caudæ 4·5, acrotarsi 1·1, dig. med. sine ungue 1, hallucis sine ungue ·6, maxillæ a fronte ·9, mandibulæ ab articulo 1·4 poll. Angl.

Four specimens. "Common in woods." Native name "Shukerrou Dhungow."

Resembles most nearly *Turtur picturatus*; but the forehead and top of the head are not bluish as in that species, but of the same vinous tint as the back; and in this respect it resembles the *T. aldebranus* of Aldebra, and *T. rostratus* of the Seychelles; but it differs from the former in the less vinous colouring of the back, rump, and tail, and from the latter in the smaller bill and browner tail-feathers.

20. Turtur semitorquatus.

Turtur semitorquatus, Sclater, Ibis, 1864, p. 300; Schlegel & Pollen, Rech. Madag. p. 113.

Three specimens. "Common, especially near the coast." Native name "Shukerou."

This South-African species, which is not found in Madagascar, has probably been introduced into the island.

21. Alectrœnas sganzini (Verreaux).

Funingus sganzini, Hartl. Madag. p. 64.
Alectrœnas sganzini, Sclater, Ibis, 1864, p. 300.
Ptilopus sganzini, Schlegel & Pollen, Rech. Madag. p. 115, pl. xxxvii.

Seven specimens. "Common; a stupid bird, allowing you to get quite near it; food in crop small figs; iris red." Native name "Ningha."

22. NUMIDA TIARATA, Bonaparte.

Numida tiarata, Hartl. Madag. p. 68; Schlegel & Pollen, Rech. Madag. p. 118.

Numida mitrata?, Sclater, Ibis, 1864, p. 300.

Numida mitrata (pt.), Elliot, Monogr. *Phasianidæ*.

Three specimens. "Very plentiful." Native name "Congha."

It is possible that this bird may have been introduced into Anjuan, as it has been into Mauritius and Rodriguez and, according to MM. Pollen and Van Dam, into the little island of Bouzy near Mayotte.

23. COTURNIX COMMUNIS, Bonnaterre.

Coturnix communis, Schlegel & Pollen, Rech. Madag. p. 120.

One specimen. "Very common." Native name "Phayphayra."

24. ARDEA IBIS.

Ardea ibis, Schlegel & Pollen, Rech. Madag. p. 124.

Two specimens. Native name "Soaugha." Mr. Sclater (Ibis, 1864, p. 301) has included *Ardea comata* (by which I presume he means *A. leucoptera*) in his list.

25. BUTORIDES ATRICAPILLA.

Ardea atricapilla, Schlegel & Pollen, Rech. Madag. p. 125.

One specimen. "Not common." Native name "Donkerhay."

26. STREPSILAS INTERPRES.

Strepsilas interpres, Sclater, Ibis, 1864, p. 301; Schlegel & Pollen, Rech. Madag. p. 130.

Two specimens. "Common on sea-shore and the mouths of rivers for a mile up." Native name "Shejoryjory."

27. TRINGOIDES HYPOLEUCUS.

Tringoides hypoleucus, Sclater, Ibis, 1864, p. 301.

Actitis hypoleucos, Schlegel & Pollen, Rech. Madag. p. 133.

Three specimens. Not distinguished by the natives from the last.

In addition to the above, Mr. Bewsher writes:—"Besides these I saw a Swallow, a Swift, and a Grebe on the lake in the mountains; a large black-and-white Hawk *rare* and very wild, and a large Crane or Heron. I was told there were also (but I never saw them) a small brown Hawk, a green and brown Pigeon, a chocolate Pigeon with white breast, a Mocking-bird, large (male blue-grey, female brown), three, if not four, species of Owl, a Parroquet, green, with grey head, probably the Love-bird common on the north-west coast of Madagascar."

I append a tabular statement, showing the geographical distribution throughout the group of each species. From this it will be seen that we absolutely know nothing of the avifauna of the Great Comoro, and a fine field is here open for any adventurous naturalist and traveller.

Table showing the Distribution of Birds known to inhabit the Comoro Islands.

B.=Bewsher. D.=Dickinson. K.=Kirk. P.=Peters. P. & V. D.=Pollen and Van Dam.

	Grand Comoro.	Mohilla.	Anjuan.	Mayotte.
Falco minor	.....	.....	D.	
Accipiter pusillus	.....	.....	D., Playfair, B.	
—— brutus	.....	.....	.....	P. & V. D.
Circus maillardi	.....	.....	D.	
Milvus ægyptius	.....	.....	Playfair, B.	P. & V. D.
*Aluco flammeus	.....	.....	B.	
Scops menadensis	.....	.....	.....	? P. & V. D.
Coracopsis comorensis	.....	.....	P., K., B.	
*—— barklyi†	.....	.....	B.	
Leptosomus discolor	.....	.....	D.	
*Corythornis vintsioides	.....	.....	B.	P. & V. D.
Merops superciliosus	.....	K.	B., P. & V. D.	P. & V. D.
Cypselus ambrosiacus	.....	.....	.....	P. & V. D.
Nectarinia coquereli	.....	.....	.....	P. & V. D.
—— comorensis	.....	.....	P., B.	
Zosterops mayottensis	.....	.....	.....	P. & V. D.
*—— anjuanensis, sp. nov.	.....	.....	B.	
Tchitrea pretiosa	....	.....	.....	Lesson, P. & V. D.
—— vulpina, sp. nov.	.....	.....	Speke, B.	
Dicrurus forficatus	.....	.....	D., K., B.	
—— waldeni	.....	.....	.....	P. & V. D.
—— madagascariensis	.....	K.		
*Ellisia longicaudata, sp. nov.	.....	.....	B.	
*Hypsipetes ourovang	.....	K.	B.	P. & V. D.
*Turdus bewsheri, sp. nov.	.....	.....	B.	
*Corvus madagascariensis	.....	.....	B.	P. & V. D.
*Spermestes cucullatus†	.....	.....	B.	
Foudia madagascariensis	.....	? K.		
*—— algondæ	.....	.....	B.	P. & V. D., Monestier.
*Columba polleni	.....	.....	B.	P. & V. D.
Peristera tympanistria	.....	.....	.....	P. & V. D.
Turtur comorensis, sp. nov.	.....	.....	B.	P. & V. D.
—— semitorquatus†	.....	.....	D., B., P. & V. D.	P. & V. D.
Alectrœnas sganzini	.....	.....	K., D., B.	P. & V. D.
Numida tiarata†	.....	.....	? K., B., ? P.	? P. & V. D.
*Coturnix communis	.....	.....	B.	P. & V. D.
Ardea gularis	.....	.....	.....	P. & V. D.
—— leucoptera	.....	.....	D.	
*—— ibis	.....	.....	B.	
*Butorides atricapilla	.....	.....	B.	P. & V. D.
Charadrius, sp. ign.	.....	.....	P.	
——, sp. ign.	.....	.....	P.	
Strepsilas interpres	.....	.....	P., B.	
Tringoides hypoleucus	.....	.....	D., B.	
Podiceps, sp. ign.	.....	.....	K.	
Prion banksi	.....	.....	D.	
	0	4	35	22

* First observed in Anjuan by Mr. Bewsher. † Perhaps introduced.

April 17th, 1877.

Osbert Salvin, Esq., F.R.S., V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of March 1877.

The total number of registered additions to the Society's Menagerie during the month of March was 118, of which 53 were by presentation, 7 by birth, 43 by purchase, 12 were received on deposit, and 3 by exchange. The total number of departures during the same period, by death and removals, was 76.

The most noticeable additions during the month of March were as follows:—

1. A collection of rare Himalayan Passeres, purchased March 8, embracing examples of the following ornamental species, new to the Society's Collection, viz. *Megalæma hodgsoni*, *Grammatoptila striata*, *Sibia capistrata*, and *Hemixos flavala*.

2. Two young male Orang-outangs (*Simia satyrus*), presented March 13, by Dr. R. Sim, F.Z.S.

A letter was read addressed to the Secretary by Mr. A. Welles, of Christchurch, New Zealand, giving an account of the success which had attended the endeavours of the Acclimatization Society of that colony to introduce Salmon into New Zealand from the U. S. of America.

Mr. Sclater exhibited specimens of the young Anacondas which had been produced dead by the large female of this Snake purchased on the 15th of February 1877.

Two young had been produced on the 2nd inst., and one other subsequently; but it seemed probable that more would follow.

Another member of the Boidæ that had produced young ones (already extruded from the egg) in the Gardens was stated to be the Yellow Boa of the Antilles (*Chilobothrus inornatus*).

Mr. Sclater called attention to two large photographs of the young Gorilla (*Troglodytes gorilla*) now living in the Aquarium at Berlin, which had been kindly forwarded to the Society by the authorities of that Institution.

This animal had been obtained by Dr. Falkenstein, of the German West-African Expedition, on the 2nd of October 1875, at Ponta Negra (about two days' journey inland from Chincoxo) on the West-African coast, from a Portuguese. The Portuguese had received it from a negro, who had shot the mother a few days before and captured the young one. Dr. Falkenstein had brought the animal with him to Berlin, and sold it to the Berlin Aquarium on the 30th of June 1876, for 20,000 marks (£1,000) which went to the benefit of the Expedition.

On its arrival in Berlin the Gorilla weighed 30 lb. (German); it

was now stated to weigh 43 lb., and to be in excellent health and condition, although it had been twice seriously ill.

Mr. Sclater took this opportunity of recording the fact that this was not the first living example of the Gorilla that had been brought to Europe alive, as was shown by the following note from Mr. A. D. Bartlett, the Superintendent of the Society's Gardens:—

"In the year 1861, I saw in the collection of the late Mr. Chas. Waterton a mounted specimen of a young Gorilla. It had been prepared from an individual that had been exhibited alive in the No. 1 Collection of Wombwell's travelling menagerie, where it had lived upwards of 7 months[1].

"Mrs. Wombwell's daughter subsequently lent me a photograph of this animal, which had been taken during its lifetime. This photograph I showed to Prof. Owen, and afterwards lent to Mr. Wolf, who, I believe, used it to assist him in a drawing of the Gorilla. About two years since I sent the photograph back to the owner (Mrs. Fairgrieve), who was then living at Lauriston in Edinburgh."

Mr. Sclater exhibited the very beautiful chalk drawing by Mr. Wolf (see Plate XXXV.) which had been prepared from the photograph in question, and pointed out that there could be no doubt that Mr. Bartlett's statement of the animal having been a young Gorilla was correct. Mr. Waterton's collection was, he believed, now at Ushaw College, Durham, where, no doubt, the stuffed specimen was still to be seen.

The following papers were read:—

1. On the Bursa Fabricii in Birds.

By W. A. Forbes, F.Z.S.

[Received March 13, 1877.]

Prof. Garrod, in his paper on *Plotus anhinga* (P. Z. S. 1876, p. 344) says:—"In the urino-genital system of *Plotus anhinga*, in both sexes, the ducts open in the normal manner into the cloaca, just above its lower orifice. This orifice, however, is not on the surface, but is into a cavity behind the cloaca, which opens externally quite close to the place where the two communicate. Except for the nearly marginal orifice, the second cavity is a cæcal sac, oval in shape, and about 1½ inch high, covered at its blind end with the crypts of shallow glands, which also run down its sides. That it is a modification of the *bursa Fabricii* cannot be doubted."

The disposition of the parts described above seemed peculiar enough to be worthy of further investigation; with that end my kind friend Prof. Garrod requested me to undertake a series of observations on the bursa in other birds, in order to throw further light on the structure of this organ, and to discover what characters, if any, it afforded for classificational purposes. The ample materials of the

[1] *Cf.* Gray, P. Z. S. 1861, p. 278.



Wolf del. J.Smit lith. M&N Hanhart imp.

TROGLODYTES GORILLA

Prosector's department have given me opportunities for examining this organ in a considerable number of species of birds of various orders; and though I regret to say my investigations have not turned out so satisfactorily as regards taxonomic characters as I had hoped, I venture to bring such results as I have obtained before the Society this evening. As the subject of the bursa Fabricii has hardly attracted any notice in this country since the days of Harvey, I have added to my own notes a brief résumé of the most important observations and opinions as regards its structure and functions that have been brought forward by foreign anatomists.

The organ in question seems first to have been noticed by the naturalist whose name it bears, Fabricius of Acquapendente. In his treatise 'De formatione ovi et pulli'[1], p. 5, he says:—"Tertium quod in podice est adnotandum est duplex vesicula quæ in ima ejus parte ad os pubis supereminet, et conspicua exteriorque apparet, simulatque uterus jam propositus conspectui sese offert: quæ cum sit pervia, ita ut ab ano ad ipsum uterum et ab utero in ipsam, ut puta superius, infra foramen pateat, ex altero autem extremo clausa sit, hunc existimavimus esse locum, in quem gallus semen immittit porrigitque ut inibi servetur." From this and other passages in his works it is clear that he considered its function that of a *receptaculum seminis* in the female; its use in the male, on such a theory, he does not explain. Harvey, in his work 'De Generatione Animalium' (London, 1651), as quoted in the Sydenham Society's translation of his works (1847, p. 183), refutes Fabricius's ideas on this point. "The foramen into which Fabricius believes the Cock to inject his fluid, is discovered between the orifices of the vulva and the rump. I, however, deny any such use to this foramen; for in young chickens it is scarcely to be seen, and in adults it is present indifferently in males and females. It is obvious therefore that it is both an extremely small and obscure orifice, and can have no such important function to fulfil; it will scarcely admit a fine bristle and needle, and it ends in a blind cavity; neither have I ever been able to discover any spermatic fluid within it, although Fabricius asserts that this fluid is stored up there even for a whole year, and that all the eggs contained in the ovary may be thence fecundated, as it is afterwards stated." Harvey, however, fell into error in asserting that in "young chickens it was scarcely to be seen;" as we shall afterwards see, it is developed more in young than adult birds. This fact was first pointed out by Tannenberg in 1789, in his disquisition 'Circa genitales partes mascularum avium' (Gottingæ), and has subsequently been recognized by most authors who have written on the subject (*vide* Cuvier[2], Milne-Edwards[3], and Gegenbaur[4]). Barkow, in a paper "On the Cloaca of birds" in Meckel's 'Archiv'[5], describes its condition in specimens he had examined of the Fowl, Duck,

[1] Hieronymi Fabricii ab Aquapendente opera anatomica. Patavii, 1625.
[2] Leçons d'Anatomie comparée, 2nd ed. vol. viii. p. 276.
[3] Physiologie et Anatomie comparée, vol. viii. p. 514, and vol. vii. p. 347.
[4] Vergleichende Anatomie, p. 799, note.
[5] Archiv, 1829, p. 443 *et seq.*

Hooded Crow, Jackdaw, Bittern, Eared Owl (*Ohrkauze*), Honey-Buzzard, and Coot, showing that it is fully developed in young birds, but absent in old ones. He figures the bursa, together with the arteries supplying it (derived from the left pudendal), in both sexes of *Gallus domesticus* and *Fulica atra* (*op. cit.* tab. ix. fig. 13, 15, 19, 22–24, and t. x. f. 26). Berthold devotes a special memoir to it[1], in which he describes its nervous and vascular supply. Emil Huschke[2] describes its development, showing that it arises in the superior part of the cloaca, in which it is differentiated in the embryo of the Fowl from the 8th to the 9th day of incubation, acquiring by degrees a more perfect form, but that after a time it increases but slowly in comparison with the other parts of the embryo. M. Martin St.-Ange, in his fine paper "Etudes sur l'appareil reproducteur dans les cinq classes des vertébrés"[3], figures and describes the bursa in the Common Pigeon. In one adult two-year-old Pigeon he found the interior of the bursa filled up with a sort of calculus, forming a complete cast of its interior. In all others of both sexes, it was reduced to about half its size, and the cavity entirely obliterated. He found that in the egg it was better-developed in proportion than other organs, but that after the age of about six months in Pigeons, and eight in Fowls, it began to lose its functional activity, and to become reduced in size. Lastly, in a paper published in the 'Atti della Società Italiana di Scienze Naturali,' 1875, vol. xviii. pp. 133–169 (for calling my attention to which I am indebted to Mr. Salvin), Signor Vincenzo Alesi, of Naples, has published an exhaustive essay on the structure and development of this organ, accompanied by two plates of histological details. His observations have been made on specimens of *Meleagris mexicana*, *Anser cinereus*, *Anas boschas*, *Columba livia*, *Turtur auritus*, *Corvus monedula*, *Turdus merula*, and *Coturnix communis*; and he has also examined the cloaca of a female *Rhea americana*, preserved in the Naples Museum. To his observations on the histological structure and process of atrophy of the bursa I will return after having briefly described the ordinary form and relations of this organ in the birds I have examined. These are 90 in number; and of many of them I have examined more than one specimen.

PASSERES.

Oriolus galbula.
Garrulax chinensis.
Citta thalassina.
Fregilus graculus.
Amblyrhamphus holosericeus.
Cissopis leveriana.

COCCYGOMORPHÆ.

Podargus cuvieri.
Dacelo gigantea.
Colius castanonotus.
Momotus lessonii.
Merops, sp.
Megalæma, sp.
Rhamphastos ariel.
Pteroglossus wiedi.
Trogon puella.
Cuculus canorus.
Cacomantis, sp.

[1] Acad. Cæs.-Leop. Nova Acta, 1828, xiv. pp. 903–918.
[2] De Bursæ Fabricii origine. Jenæ, 1838.
[3] Mém. prés Ac. Sc. Franc. par savants divers, 1856, pp. 1–232.

Chrysococcyx, sp.
Geococcyx affinis.
Guira piririgua.

PSITTACI.

Stringops habroptilus.
Psittacus erithacus.
Pionus violaceus.
Tanygnathus muelleri.
Pyrrhulopsis splendens.
Platycercus icterotis.

ACCIPITRES.

Gyparchus papa.
Buteo jackal.
Archibuteo lagopus.
Geranoaëtus aquila.
Spizaëtus coronatus.
Haliaëtus vocifer.
Strix flammea.

STEGANOPODES.

Sula bassana.
Plotus anhinga.
Phalacrocorax carbo.
P. brasiliensis.

HERODIONES.

Ciconia alba.
C. boyciana.
Abdimia sphenorhyncha.
Xenorhynchus australis.
Ibis falcinellus.
I. rubra.
Ardea cocoi.
Cancroma cochlearia.

PALAMEDEÆ.

Chauna derbiana.

ANSERES.

Cygnus olor.
Tadorna rutila.
Fulica rufigula.

COLUMBÆ.

Pterocles arenarius.
Phaps chalcoptera.
Goura coronata.

GALLINÆ.

Crax sclateri.
Tetrao urogallus.
Lagopus scoticus.
Ortyx virginianus.
Odontophorus guianensis.
Callipepla gambeli.
Arboricola torqueola.
Caccabis chukar.
C. melanocephala.
C. saxatilis.
Francolinus vulgaris.
F. bicalcaratus.
Euplocamus cristatus.
Argus giganteus.
Meleagris mexicana.

ALECTORIDES.

Otis tarda.
Grus carunculata.
Serpentarius reptilivorus.
Ocydromus australis.
Porphyrio alleni.
P. martinicus.
P. poliocephalus.
Hydrophasianus chirurgus.

GRALLÆ.

Œdicnemus crepitans.
Attagis, sp.

GAVIÆ.

Larus ridibundus.

PYGOPODES.

Uria troile.
Alca torda.

TINAMI.

Rhynchotus rufescens.
Crypturus tatupa.

STRUTHIONES.

Struthio camelus.
Rhea americana.
Dromœus novæ-hollandiæ.
Casuarius beccarii.
C. picticollis.
C. uniappendiculatus.
Apteryx mantelli.
A. oweni.

For an opportunity of examining a specimen of the last I am indebted to Prof. Newton's kindness.

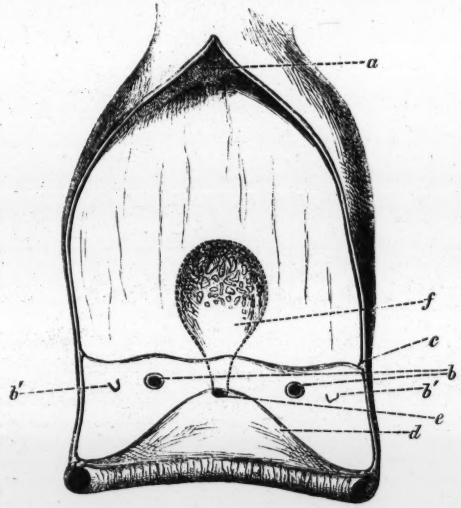
If the cloaca of an ordinary bird be taken and laid open in front (*i. e.* on the ventral surface) along the middle line, the rectum will be seen to terminate at the top of a more or less well-marked chamber, which usually is more capacious than the terminal part of the alimentary tract, from which it is generally separated off by a more or less plain valvular constriction, the different nature of the two parts being also frequently shown by the differences in the character of the mucous membrane lining them. Below the entrance of the rectum, on the posterior wall of the cloaca, and disposed symmetrically as regards the median line on the sides of which they lie, are the openings of the uro-genital ducts, frequently elevated on papillæ, which vary in shape in different birds. Of these the ureters open nearest the middle line; externally to them are the openings or opening of the vasa deferentia or oviduct, which latter is fully developed only on one side, though sometimes a trace of it may be seen on the other also. Above the uro-genital papillæ in many birds (e. g. *Meleagris mexicana* and *Tetrao urogallus*) is a well-marked valvular fold of mucous membrane, which thus separates off the upper portion of this "cloaca" from that part into which the urino-genital ducts open. Below these, again, is a similar, but usually better-marked fold (the vesical sphincter of St.-Ange), which is present in all the birds I have examined, in a more or less developed state. Below this in the middle line, and also on the posterior wall, is seen (if the specimen be not too old) a circular hole of varying dimensions. This is the opening of the "bursa Fabricii." This third part of the "cloaca" is bounded below by the external sphincter muscles, which often form in birds a great thick fleshy mass; this chamber, from lodging the penis or clitoris, is denominated "loge copulatrice" by M. St.-Ange. In many birds additional glands, opening by large pores, or forming irregular arborescent patches, are developed in the walls of the cloaca in this region. It results therefore from the above-described disposition of parts that, in its most developed form, a bird's "cloaca" is divided into three chambers communicating with each other, and into which open respectively (from above downwards), first the rectum, secondly the urino-genital ducts, thirdly the bursa Fabricii[1]. This disposition of parts is seen in fig. 1 (p. 309). The bursa Fabricii, when well developed, consists of a sac-like pouch, usually with thick glandular walls: it is blind above and constricted below, and opens by a simple rounded orifice without any valve[2]

[1] Prof. Huxley describes it ('Anatomy of Vertebrate Animals,' p. 308) as opening into the "*anterior* and dorsal region of the cloaca." If "anterior" mean here, as I suppose it does, "anterior" as regards the whole length of the digestive tract, this is an error; for, as I have above stated, the opening of the bursa is in the lowest chamber of the cloaca (*i. e.* that nearest the vent), and therefore into the most "posterior" one as regards the general direction of the alimentary canal.

[2] Barkow, *l. s. c.*, describes the lower part of the peduncle of the bursa as projecting into the cloaca in the common Fowl, and there forming a conical sort of flap (*Zipfel*) over the opening. I have never myself seen any thing like this "Zipfel" in any bird I have examined; and all other writers are equally silent on the point. Most, indeed, say expressly that there is no valve or flap of any kind.

into the cloaca at the point already indicated. The bursa lies on the posterior wall of the cloaca (to which it is usually attached by a kind of aponeurosis) in the space between the cloaca and the pelvis. This

Fig. 1.



Cloaca of *Chauna derbiana*, laid open from before.

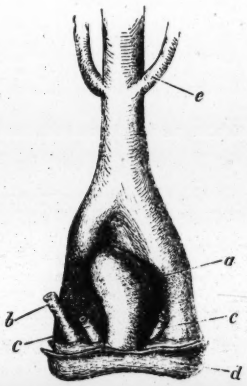
a. Rectum. *b*. Opening of ureters. *b′*. Genital papillæ. *c*. Fold of mucous membrane. *d*. "Vesical sphincter" of M. St.-Ange. *e*. Opening of bursa Fabricii. *f*. Bursa Fabricii (supposed to be seen through the posterior wall of the cloaca).

disposition of parts, as seen from behind, is shown in fig. 2 (p. 310), in the common Guillemot. The bursa when laid open frequently contains fæcal matter, more or less hard, or may be empty. The walls may be thin, as in the *Passeres*, Parrots, &c., or thick and markedly glandular, as in the *Gallinæ*, *Herodiones*, &c. The bursa is usually constricted below into a narrow peduncle, with a narrow central channel; above, the contained cavity is more considerable but of varying dimensions.

Signor Alesi, in the paper already referred to, has described at great length the minute structure of the bursa Fabricii in the common Fowl and some other birds. I must here content myself with giving a brief résumé of his conclusions as regards the histological structure of the organ in question. A transverse section of the wall in the neighbourhood of one of the ridges into which, in the Fowl and allied forms, the interior of the bursa is raised shows

the following constituent parts:—(1) an external layer of connective tissue, covering (2) a thick layer of elastic membrane; inside this is (3) a thin layer of mucous membrane, which unites together and connects the "lymphatic follicles." These "lymphatic follicles" consist of masses of minute rounded cells, on an average 0·04 millim.

Fig. 2.



Back view of Cloaca of *Uria troile*.

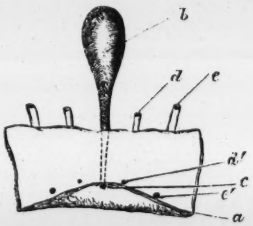
a. Bursa Fabricii. *b*. Oviduct. *c*, *c*. Ureters. *d*. Sphincter muscles. *e*. Cæca.

in diam., enclosed in capsules of connective tissue, in which ramify their nutrient vessels &c. The lymphatic follicles are bound together by processes of the connective mucous membrane into raised processes, which project on the interior of the bursa, forming ridge-like "crests," and are covered with epithelium internally, the cells of the latter being lanceolate with oval nuclei. In *Rhea*, however, the follicles are not closely bound together in masses forming ridges, but are attached by peduncles of elastic tissue to a central stem, the whole having somewhat the appearance of a bunch of grapes with a few berries on it. As we have already seen, Tannenberg in 1789 was the first to point out that the bursa was more developed in young than old birds, it being gradually reduced and obliterated in the latter. This process of atrophy seems to obtain in all birds, so far as I can make out, though the periods of final disappearance seem to vary much in different groups. M. Martin St.-Ange found that the bursa began to lose its functional activity in Pigeons after six months, and in Fowls after eight; as a rule it seems to atrophy at about the period of full growth. On the other hand, in some cases it persists for long periods, and probably throughout life; for I found it well developed and quite open in a specimen of *Platycercus icterotis* that

had lived in the Society's Gardens for eleven years. As a rule, the central cavity of the bursa becomes diminished and the communication with the cloaca obliterated in the process of atrophy; and finally, in some cases at least, the whole organ completely disappears, losing its characteristic form and structure, and becoming fused with the tract of abdominal aponeurosis that covers the back wall of the alimentary canal, ultimately forming a flat riband-like, or round cord-like, ligamentous structure. Spangenberg observed the conversion of the bursa Fabricii into a round cord-like ligament in the Duck; and Alesi has observed it (and described it minutely, with figures showing the histological changes that go on) in the Fowl. He sums up the process of atrophy in the last-named bird as follows:—The epithelium which covers the internal surface of the bursa becomes, as it were, invaginated into the thickness of the mucous layer, becoming pressed in between the lymphatic follicles. The connective tissue between the latter increases rapidly in bulk, and becomes full of numerous small oval corpuscles; at the same time the follicles become absorbed, and the whole of the bursa becomes obliterated and fused with part of the abdominal aponeurosis. The epithelium gradually becomes confined to certain irregular tracts in the thickness of the mass of connective tissue; but even these disappear finally. The process of atrophy in the other species which he observed is essentially the same as that in the Fowl.

I now proceed to describe the general characters of the bursa Fabricii in the groups of birds I have examined. In the *Passeres* it is usually small, pyriform, with a small opening and glandular walls without ridge-like elevations on the interior. It seems to disappear completely in adult birds. In the *Rhamphastidæ*: dis-

Fig. 3.



Cloaca and Bursa of *Geococcyx affinis*.

The cloaca is cut short and laid open from before. The narrow peduncle of the bursa is supposed to be seen through the cloaca. *a*. "Vesical sphincter." *b*. Bursa. *c*. Opening of same. *d*, *d'*. Ureter and opening. *e*, *e'*. Vas deferens and opening.

appears in the adult, only leaving a small pore to mark its place of opening. In the *Cuculidæ* it presents a very characteristic shape, the peduncle being long and thin, and the extremity club-shaped,

giving the whole somewhat the appearance of a shortened and clumsy antenna of a butterfly (see fig. 3, p. 311) It disappears completely in adult birds. In specimens of *Dacelo gigantea*, *Merops*, and *Momotus lessoni* it was sac-like and of considerable size. In the Parrots it is well marked and bag-like, opening by a small pore. As already mentioned, in an old specimen of *Platycercus icterotis* I found the bursa well marked, though its opening into the cloaca was nearly obliterated. In a specimen of *Stringops* I found *no* bursa. In the *Accipitres* it forms a moderate-sized pyriform sac; in old birds this becomes reduced to a sort of small conical pouch in the substance of the back wall of the cloaca at the place of aperture. Of the *Steganopodes*, in *Phalacrocorax* (2 species) and *Sula bassana* the bursa is a large sac, 1½–2 inches in length, which opens by a small pore in the usual places. The walls of the bursa are very thick; they are traversed by about seven rows of large, irregular, crypt-like pores, separated by smooth, narrowed, raised ridges. The ridges and pores disappear towards the base of the bursa; but the upper part has a curious honeycomb-like appearance, somewhat like that of the Ruminant *reticulum*. The internal surface is covered with numerous, small, opaque, granular-looking corpuscles, especially towards the apex. In a young specimen of *Plotus anhinga* (♀) that I dissected, the appearance and disposition of the parts agreed very well with Prof. Garrod's description. I noticed, however, that the opening of the bursa was very *slightly constricted* by a slight fold of mucous membrane on each side, so that the bursa hardly opened by its entire width into the cloacal chamber. In other respects it showed a strong approximation to the disposition of these parts that I shall presently describe in the Ostrich and its allies.

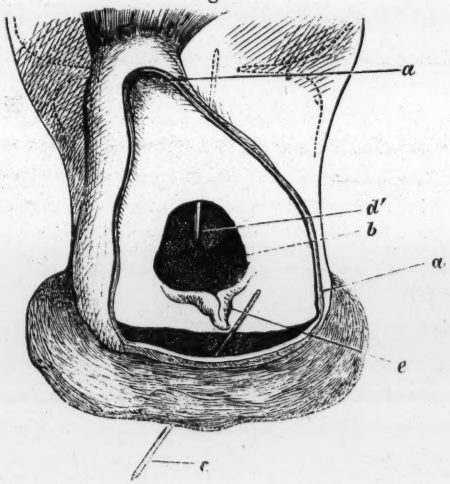
In the *Herodiones* the bursa is large and sac-like, with a small or moderate opening; its interior surface has no ridges or sulci, but large crypt-like pores collected in patches. In aged birds it seems to disappear, though in a specimen of *Abdimia* that had lived in the Gardens more than three years it was still present, ½ inch long, with the opening still unobliterated.

In *Chauna* the bursa is a glandular pyriform sac, about 1 inch in length, with a moderate-sized opening (see fig. 1, p. 309). It seems to disappear entirely in old birds. In a specimen of *Cygnus olor* it was a large conical sac, 1½ inch long, with a wide mouth, but slightly constricted off, and with no large glands. In aged specimens of *Fuligula rufina*, which had lived sixteen years in the Gardens, and of *Tadorna rutila*, which was nearly eighteen years old, the bursa had disappeared, in the former having assumed the appearance of a round cord-like ligament, in the latter having become fused with the abdominal aponeurosis. In each case a small pore marked the place of aperture.

In *Pterocles*, *Goura* (in a nine-months-old bird), and *Phaps* I have never found any thing more than a small blind pore in the usual place of the opening; as we know from M. St.-Ange, the bursa disappears very early in *Columba livia* as well.

In the *Gallinæ* the bursa has a tubular or pyriform shape, with numerous well-marked alternating ridges and furrows, the latter highly glandular, on its internal surface. These ridges are most marked towards the superior (blind) end, and are formed by the projection into the interior of collections of lymphatic follicles. These last do *not* open by distinct pores into the cavity of the bursa, but are entirely closed, as shown by Signor Alesi and Leydig. In the process of atrophy the peduncle becomes solid; also the cavity of the bursa becomes shut off from the cloaca, and persists in this state for some time. Finally, however, the bursa seems to become reduced to a ligament-like structure, or to become fused with the general aponeurosis. In the Turkey the bursa is a long tubular sac, 2 inches long, with very well marked ridges and sulci. In all a pore marks the opening of the atrophied bursa. In *Serpentarius* the bursa is

Fig. 4.



Cloaca of *Casuarius uniappendiculatus*, viewed from behind.

a, *a*. Cut surface of posterior wall of bursa. *b*. Opening of cloacal chamber into bursa. *c*. Pointer passing from cavity of bursa to exterior. *d'*. Pointer passed from cloaca into bursa through opening *b*; the upper part is supposed to be seen through the wall of cloaca. *e*. Clitoris.

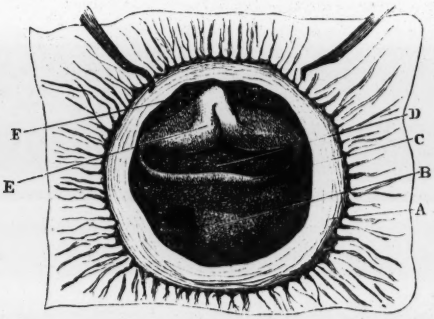
a large globular sac, with the glandular area confined to the apical region and a small aperture into the cloaca. In these respects it resembles *Otis* and *Grus*. In *Porphyrio* and *Ocydromus* it assumes the form of a long, narrow, cylindrical tube, the central cavity of which becomes closed up as atrophy advances. In *Œdicnemus* there is a similar form of bursa. In *Attagis*, on the other hand, the form is pyriform, more like that of the *Passeres* and *Gallinæ*.

In *Larus* I found the bursa represented by a small pouch. In the young *Uria troile* it is large and sac-like, and slightly curved from side to side (see fig. 2, p. 310). The walls are very glandular, and so thick that the central cavity is but small. There are no crests. In an adult *Alca torda* it was reduced to a pore-like opening.

In none of the *Tinami* that I have dissected have I found any bursa; on the other hand, the posterior wall of the third cloacal chamber is covered with numerous glands arranged in a tree-like manner.

In all the birds hitherto mentioned (with the exception of *Plotus*) the bursa, as we have seen, opens by a more or less constricted aperture into the general cavity of the cloaca. In the Struthious birds, however, the very opposite is the case. The cloaca (or at least as much of it as corresponds to the first and second chambers) *opens into the* bursa Fabricii. This will perhaps be best explained by looking at fig. 4, p. 313, representing the cloaca and bursa of a not full-grown Cassowary (*Casuarius uniappendiculatus*) from behind. The bursa is, as one sees, a large, somewhat triangular sac, attached above by a broad riband-like muscle to the posterior wall of the alimentary canal. Most of the back wall of the bursa has been cut away (*a*), to show the opening into its cavity of the cloacal chamber (*b*), out of which a pointer (*d'*) is seen passing up into the rectum above through the recto-cloacal valve. From this, I think, it will at once be evident

Fig. 5.



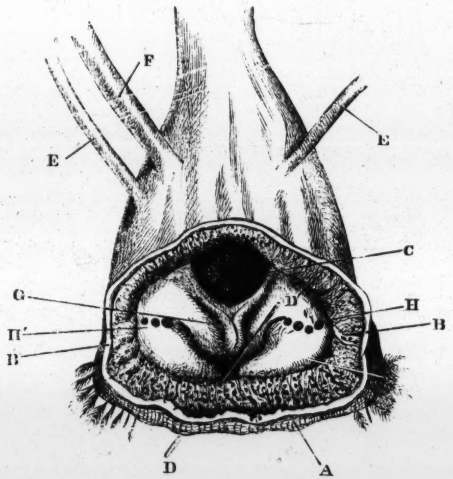
Vent of young Emu (*Dromæus novæ-hollandiæ*) with the parts still *in situ*, viewed from the outside.

A. External sphincter. B. Cavity of bursa. C. Wall of cloaca. D. Opening of cloaca into the bursa. E. Clitoris. F. Glandular pores.

that the cloaca does *not* open directly to the outer surface, but *indirectly through* the bursa by means of its large posterior and inferior aperture *b*. A similar condition of things is seen in fig. 5, in a young Emu (*Dromæus novæ-hollandiæ*)—where the parts are undisturbed

and *in situ*,—and in fig. 6, in an Ostrich (*Struthio comelus*, immature female)—where the bursa has been nearly all removed to show the posterior opening of the cloaca into its cavity, and the communication of the latter with the exterior, as indicated by the direction of the pointer (D D′). The same is the case in the young Nandou (*Rhea americana*). In all these birds the walls of the bursa are thickly

Fig. 6.



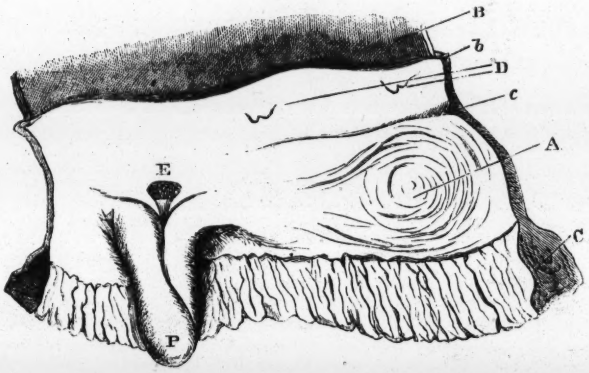
Cloaca and Bursa of young Ostrich (female), viewed from behind. Most of the posterior wall of the bursa has been removed.

A. External sphincter muscle. B. Cut surface of bursa. C. Opening of cloaca into bursa. D, D′. Pointer passing from bursa to exterior. E, E. Ureters. F. Oviduct. G. Clitoris. H, H′. Pores; beneath them the smooth, non-glandular part of the bursa.

glandular; there are no regular crests and sulci, however, but the glands are arranged in patches, the whole having a honeycomb-like or dendritic appearance. This disposition of parts, however, is not permanent. As the birds grow older, the size of the bursa gradually diminishes and its walls become less glandular; its mouth is no longer equal in extent to the whole width of the outermost chamber, but becomes narrowed; and finally the whole bursa disappears, its remains becoming lost in the muscles of the back of the cloaca. This state of atrophy of the bursa is represented in *Casuarius picticollis* in fig. 7 (p. 316), the only remains of its existence being seen in the few irregular circular folds on the mucous membrane at A.

At what age this change supervenes is not yet quite clear. The specimen of *C. beccarii* that died in the Society's Gardens last year, apparently an adult female, corresponded entirely in the disposition of these parts with the specimen of *C. uniappendiculatus* above described, which died shortly before, and was quite a young bird when received in 1874. On the other hand, in *C. picticollis* the bursa was entirely atrophied. This specimen, which also arrived in 1874, was then not quite adult; so that at the period of its death it must have been about three years old. Whether *Apteryx* agrees in these

Fig. 7.



Cloaca of *Casuarius picticollis*, adult male; viewed from before.

A. Circular folds of mucous membrane, being the last remains of the Bursa. B. Rectum. *b*. Recto-cloacal valve. C. Cut surface of external sphincter muscle. *c*. Vesical sphincter. D. Urino-genital papillæ. E. Glandular pore. P. Penis.

points also with the other *Struthiones* I am unable to say, as both the specimens I have dissected presented no trace of a bursa. Probably therefore in this, too, when adult the bursa disappears almost completely. I have mentioned above the singular differences shown by Signor Alesi to exist in the structure of the lymphatic follicles of the bursa of *Rhea* as compared with other birds.

Although at first sight the relation of these parts in *Rhea*, *Struthio*, &c. seems so different from that which obtains in other birds, yet a little reflection will, I think, convince one that it is not so in reality. I have represented diagrammatically (figs. 8 and 9, p. 317) what I conceive to be the true relations of the parts in question, denoting the homologous regions in the two forms (*Serpentarius* as illustrating the normal type, *Casuarius* the abnormal one) by similar letters. If we imagine B in fig. 8 to lose the constriction at its aperture into D, and D to become proportionately deeper, we should have a form corresponding to fig. 9, in which B passes uninterruptedly and without

constriction into D, the cavity B D thus formed receiving the aperture of C. In such a form as *Plotus*, where the opening is but very slightly constricted, we have a type connecting the two extremes; and I have seen *Rhea* in a stage very similar to that mentioned above in *Cygnus olor*. In confirmation of this view as to the true relation of these parts, in the Ostrich &c. the lower part of the bursa, in the region corresponding to D in figs. 8 and 9, is not glandular (*vide* fig. 6, p. 315, where the non-glandular part of the bursa is seen beneath pores H H′).

Fig. 8.

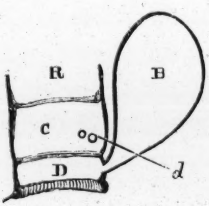


Fig. 9.

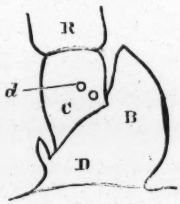


Diagram showing two chief Types of Development of the Bursa Fabricii.
R. Rectum. B. Bursa. C. Cloacal chamber. D. Lowest chamber of "cloaca." *d*. Openings of urino-genital ducts.

With regard to the function and homologies of the bursa Fabricii, great differences have prevailed amongst authors. Thus Milne-Edwards says[1], "Fabrice d'Acquapendente, à qui l'on doit la découverte de cette bourse, la considérait comme un réservoir séminal, tandis que d'autres naturalistes[2] la regardent comme une vessie urinaire. Perrault et quelques auteurs modernes[3] y voient l'analogue des glandes anales des Mammifères, et Geoffr. St.-Hilaire l'assimile aux glandes du Cowper[4]; enfin, M. Martin St.-Ange la compare à la prostate." Emil. Huschke, in the paper mentioned above, has studied its development, and, after a comparison of the organs of similar appearance, is inclined to consider it as the primitive urinary vesicle of the Wolfian bodies, from the fact that the ducts of this gland take origin from just that part of the cloaca which afterwards assumes the form of the bursa. Harvey and others have sufficiently disproved Fabricius's ideas as to its serving as a spermotheca; nor can the bursa be regarded as a urinary bladder,—first, because it is not devoted to containing the urine; secondly, because in other *Sauropsida* and also in the *Mammalia* the urinary bladder is ventral, not dorsal, in position. For a similar reason, as well as from the fact that they are *paired* organs, the "*bursæ anales*" of the

[1] Phys. et Anat. Comp. vol. viii. p. 514.
[2] *E. g.* Berthold, Acad. Cæs.-Leop. Nova Acta, xiv. p. 917, 1828, and Geoffroy St.-Hilaire, Mém. du Muséum, 1823, t. ix. p. 394.
[3] *E. g.* Carus, 'Zootomia.'
[4] Tiedemann, 'Anat. der Vögel,' 1810.

Testudinata can be in no way related to that under discussion. The anal glands of Mammals, again, open externally on the skin, and are in fact cutaneous glands. The prostate and glands of Cowper are purely male glands, and probably play some important function in the act of reproduction; so that they can hardly well correspond to an organ that is common to both sexes, and only proportionally developed in the young. It would be premature to accept Huschke's views without further observations on the subject. On the other hand, as pointed out by Signor Alesi, a lymphatic organ, constructed on a similar principle, but in a simpler form, exists in the patches of lymphatic follicles (which do not, however, in this instance project outside the mucous membrane of the intestine) in the appendix to the cæcum of the rabbit (described by Frey, 'Untersuchungen über die Lymphgefässe des Darmkanales,' Leipzig, 1863). An organ still more closely corresponding in its general shape and position with the bursa Fabricii is the sac-like pouch which opens into the *dorsal* wall of the cloaca in many Elasmobranchs[1]. The glands of this, however, differ in structure from those of the bursa Fabricii; so that at present it seems to me that we can assign no very definite analogue or homologue for the latter, but that it is a glandular outgrowth of the cloaca peculiar to birds.

In conclusion, I may briefly capitulate the chief conclusions arrived at in this paper.

(1) That the bursa Fabricii exists in both sexes, and probably in all species, of birds.

(2) That it is most developed in young birds, but becomes atrophied and more or less obliterated in adults, the period, however, of the commencement and conclusion of this process differing greatly in various birds. In some it probably persists, though in a state of functional inactivity, throughout life.

(3) That in the majority of birds the bursa is a moderate-sized or small sac, that opens by a narrow aperture on the dorsal wall of the cloaca into the lowest "chamber" of that organ.

(4) That in the Struthious birds, on the contrary (the state of *Apteryx* as regards these points being doubtful), the cloaca opens into the bursa by a posterior aperture, owing to the fact that the bursa is not constricted off at the neck, but is commensurate in extent with the third or outer chamber of the cloaca, the two being united into one. This condition, however, is only to be found in young birds.

(5) That the bursa is a glandular organ, of which lymphatic follicles are the essential constituents, but has no exact homologue in other classes of Vertebrata.

[1] Signor Alesi, in his paper, *s. c.*, alludes to this pouch as being *ventral* in position, which it certainly is not. It is figured in *Squatina vulgaris* by Gegenbaur (Vergl. Anatomie, fig. 267 *c*, & p. 798). It is absent in *Chimæra*. Leydig has described its structure ('Beitrage z. microscop. Anat. u. Entwickel. der Rochen u. Haie,' Leipzig, 1852), and found that it consisted of collections of glands similar to the glands of Brunner.



J. Smit lith.

Hanhart imp.

1 GNATHOSPIZA RAIMONDII.
2 HAEMOPHILA STOLZMANNI.

2. Liste des Oiseaux recueillis en 1876 au nord du Pérou occidental par MM. Jelski et Stolzmann. Par L. Taczanowski, C.M.Z.S.

[Received March 17, 1877.]

(Plate XXXVI.)

Les espèces de cette liste ont été trouvées dans les localités suivantes :—

Tumbez, capitale de la province du même nom, faisant partie du Département Piura, située au bord du fleuve Tumbez, qui se verse dans la baie de Guaiaquil, et est éloignée de l'embouchure d'1½ legua (6 kilomètres).

Curaracha, port de Tumbez, situé dans la vallée du fleuve, composé de quelques cabanes et de la maison du capitaine du port.

Santa Luzia, petite colonie voisine de Curaracha, près de l'embouchure du fleuve. Cette localité ainsi que la précédente aboutit au manglar (bois de Rhizophores).

Lechugal, colonie composée d'une dizaine de cabanes, située sur la rivière Zurumilla, qui constitue la frontière entre Pérou et l'Equadeur. Le caractère du pays est différent de celui des localités précédentes. L'abondance de l'*Usnea* qu'on y trouve a ce rapport avec l'ornithologie, que beaucoup d'oiseaux l'employent à la construction de leurs nids.

Poso de Lambedero, grand étang, long de 2 kilomètres, situé au milieu de forêt au voisinage de Lechugal. *Parra jacana*, *Ceryle cabanisii*, et *Fluvicola atripennis* proviennent de cet étang.

Troglodytidæ.

1. Campylorhynchus balteatus (Baird).

Trois exemplaires de Tumbez. Iris blanc rose.

2. Thryothorus superciliaris, Lawr.

Une paire de Tumbez. Iris brun.

Mniotiltidæ.

1. Parula pitiayumi (Vieill.).

Un mâle de Tumbez. Iris brun foncé.

2. Geothlypis poliocephala, Baird ?

Un mâle de Tumbez. Iris brun foncé.

3. Polioptila albilora, Scl. P. Z. S. 1860, p. 298.

Un exemplaire de Tumbez. Iris brun foncé.

Vireonidæ.

Cyclorhis virenticeps, Scl. P. Z. S. 1860, p. 244, tab. clxiv.

Un exemplaire de Tumbez. Iris orangé.

Hirundinidæ.

Progne tapera (L.).

Un exemplaire tué entre Tumbez et Santa-Luzia. Iris brun foncé.

Tanagridæ.

1. Tanagra cyanoptera, Vieill.

Un mâle de Tumbez, une femelle de Lechugal.

2. Saltator olivascens, Cab.

Une paire tuée à Lechugal dans le mois de Mars. L'iris est indiqué bleu dans le mâle, et brun foncé dans la femelle.

3. Euphonia crassirostris, Scl. P. Z. S. 1856, p. 277.

Une femelle de Lechugal. Iris brun foncé.

Fringillidæ.

1. Spermophila telasco, Less.

Une femelle de Tumbez.

2. Neorhynchus nasesus (Bp.).

Un mâle adulte de Tumbez.

Gnathospiza, n. g.

Rostrum Geospizæ, *robustum, subcompressum, culmine modice arcuato, capitis verticem vix superante; lateribus mandibulæ inferioris subplanis; naribus basalibus, non tectis. Alæ mediocres, caudam dimidiam æquantes, remige primo et secundo æqualibus, omnium longissimis; tertius vix brevior. Cauda brevis, æqualis. Tarsi mediocres, graciles; digitus posticus intermedio non robustior et brevior; digiti externi inter se æquales; ungues graciles. Color coturniculinus.*

3. Gnathospiza raimondii, n. sp. (Plate XXXVI. fig. 1.)

Mas supra fulvo-griseus, fusco maculatus, capite flavido lavato; subtus isabellino-albidus, lateribus fulvo-griseis; loris, collo antico, regione oculari, pectore medio, flexura alarum subcaudalibusque citrino-flavis; alæ et cauda fuscæ, primariis flavido, secundariis albido tenuissime limbatis; tectricibus alarum tertiaribusque rufescenti-griseo late marginatis; rectricum dimidio basali flavo, terminali albido limbato; subalaribus albis. Rostrum pallide brunneum, pedes carnei, ungues pallidi, iris fusco-brunnea.

Fœm. mari similis, sed colore flavo pallidiore et minus extenso.

		♂. mill.	♀. mill.
Long.	tota	123	120
,,	alæ	69	65
,,	caudæ	72	72
,,	tarsi	19	18
,,	rostri	13	13

Dans le mâle les parties supérieures sont d'un fauve grisâtre varié de taches brunes occupant le milieu de chaque plume, grosses et bien distinctes au dos, petites et moins apparentes au sommet de la tête, qui est en outre légèrement coloré d'une nuance verte jaunâtre ; les côtés du visage sont d'un jaune verdâtre plus intense et plus uniforme. Les lores, le tour des yeux, le menton, une moustache bordant la naissance de la mandibule inférieure, le devant de la gorge, et le bord des ailes sont jaunes ; les côtés du cou gris avec une grande tache blanchâtre bien prononcée. Le milieu de la poitrine et le ventre sont blancs d'une légère teinte isabelle et colorés çà et là de jaune ; les flancs gris, striés insensiblement d'une nuance plus foncée ; les subcaudales sont blanchâtres avec le centre de chaque plume plus ou moins coloré de jaune. Les ailes et la queue brunes ; sur les remiges primaires une fine bordure jaunâtre, et blanchâtre sur les secondaires ; les tertiaires et les couvertures supralaires bordées largement de fauve roussâtre ; les bordures des rectrices jaunes dans la moitié basale, et blanchâtres dans la terminale ; les subalaires blanches. Le bec est brunâtre clair, à mandibule inférieure plus pâle ; les pattes de couleur chair pâle, ainsi que les ongles ; iris brun foncé.

La femelle ressemble au mâle ; mais elle a le jaune du visage beaucoup plus pâle, et occupant seulement les lores, le menton, les moustaches, le tour des yeux et une bande sourcilière bien distincte ; les subcaudales sont aussi légèrement colorées de jaune ; le bord de l'aile est blanchâtre. Elle n'a point de nuance verdâtre sur le dessus et les côtés de la tête. Les ailes et la queue sont comme dans le mâle. Sur les côtés de la gorge elle a deux raies longitudinales grises bien distinctes, et qui dans le mâle sont en grande partie effacées par la couleur jaune.

Un mâle, probablement jeune, ressemble en tout à la femelle et n'en diffère que par le jaune du visage un peu plus intense, les subcaudales un peu plus colorées de jaune, ainsi que le bord de l'aile ; il a aussi un peu de jaune au bas de la gorge.

Trois mâles et une femelle des environs de Tumbez, tués à la fin de mai et dans la moitié de juin. Tous ces exemplaires sont en plumage tout frais, il est donc à espérer qu'à l'epoque de la noce la coloration est beaucoup plus prononcée dans certains détails. Cet oiseau s'y trouve en grand nombre, et M. Jelski dit que les bandes dans lesquelles il se tient ordinairement sont les plus nombreuses qu'il rencontrait pendant toute sa carrière d'ornithologiste.

Je suis heureux de pouvoir dédier cet intéressant oiseau à M. Raimondi, savant directeur du Musée de Lima, et qui ne cesse pas de travailler avec beaucoup de succès à l'exploration scientifique du Pérou.

4. Camarhynchus cinereus, Bp.

Guiraca cinerea, Lafr. Mag. Zool. 1843, pl. 20.

Camarhynchus cinereus, Salvin, Trans. Zool. Soc. ix. p. 491.

Trois mâles de Tumbez, tués à la fin de février et au commencement de mars. Iris brun clair.

5. Hæmophila stolzmanni, n. sp. (Plate XXXVI. fig. 2.)

Supra cinereo-grisea fusco maculata ; subtus albida, pectore hypochondriisque griseo indutis ; capite binis vittis latis brunneo-ferrugineis, striga postoculari brunnea, mystacibus fuscis, loris superciliisque albidis notato ; alæ et cauda fusco-brunneæ, remigibus tectricibusque majoribus fusco limbatis, tectricibus minoribus castaneis, flexura alarum flava. Rostri fusco-brunnei mandibula inferior flavida ; pedes sordide carnei ; iris rubro-brunnea. Long. tota 143 *mill., alæ* 68, *caudæ* 57, *tarsi* 20, *rostri a commissura* 16.

Le sommet de la tête est occupé par trois larges bandes longitudinales, dont celle du milieu est cendrée striée de brun, et bordée de chaque côté d'une bande également large brune ferrugineuse ; ces deux dernières passent en noir au front et se rapprochent entre elles de sorte à atténuer la médiane grise en une raie linéaire blanche ; les lores et les sourcils blancs, ces derniers teints d'une nuance cendrée dans leur partie postérieure ; un trait brun ferrugineux se trouve en arrière de chaque œil ; les joues et les côtés du cou sont d'un gris cendré ; la gorge blanche bordée des deux côtés d'une fine moustache foncée, commençant à la naissance de la mandibule inférieure ; entre cette moustache et la couleur grise des joues se trouve une large raie blanche. Le dos est gris strié de brun foncé ; le croupion gris unicolore. Tout le dessous est blanchâtre teint de grisâtre sur la poitrine et les côtés du ventre. Les ailes et la queue sont bruns à remiges bordées de fauve ; les petites couvertures terminées largement de roux cannelé de manière à former une couleur uniforme sur le devant de l'aile ; les grandes couvertures bordées de fauve blanchâtre ; le bord de l'aile est d'un jaune pâle ; les subalaires blanches ; les fines bordures des rectrices grises, et celles des externes blanchâtres.

Deux mâles de Tumbez, tués le 26 mars.

6. Coryphospingus cruentus (Less.).

Deux mâles et une femelle de Lechugal, tués dans la moitié de mars. Iris brun foncé.

7. Poospiza bonapartii, Scl.

Un mâle de Tumbez, tué le 23 juin. Iris brun foncé.

8. Sycalis flaveola (L.).

Trois paires de Tumbez, où l'oiseau est très-commun. Iris brun foncé.

Icteridæ.

1. Cassicus flavicrissus, Scl. et Salv. P. Z. S. 1860, p. 276.

Deux mâles et une femelle de Lechugal, tués dans le mois de mars ; connu dans la contrée sous le nom Coulemba. Iris bleu clair.

2. Cassicus prevosti, Less.

Un mâle de Tumbez, tué le 23 juin. Iris blanc jaunâtre.

3. Trupialis loyca (Molina).

Un mâle de Tumbez, tué le 2 mars. Iris brun foncé.

4. Molothrus, sp.?

Deux exemplaires de Tumbez sans indication de sexe, probablement des femelles.

5. Icterus mesomelas, Wagl.

Un mâle de Tumbez.

6. Icterus grace-annæ, Cassin, Proc. Acad. Philad. 1867, p. 52.

Une paire de Tumbez. Iris brun foncé.

7. Aphobus chopi (Vieill.).

Un exemplaire de Tumbez. Iris brun foncé.

8. Cassidix ater (Vieill.).

Un mâle de Lechugal.

9. Quiscalus assimilis, Scl.

Une femelle de Santa-Luzia, tuée le 13 janvier. Iris brun foncé.

Corvidæ.

Cyanocorax mystacalis (Geoff.).

Un mâle de Tumbez, tué le 26 janvier. Iris jaune clair.

Dendrocolaptidæ.

1. Furnarius cinnamomeus, Lafr.

Trois exemplaires de Tumbez, tués le 13 janvier et le 17 juin. Iris blanc jaunâtre.

2. Xiphorhynchus thoracicus, Scl.

Une femelle de Lechugal. Iris brun foncé.

3. Picolaptes souleyeti (Des Murs).

Un exemplaire de Tumbez, tué le 28 janvier. Iris brun foncé.

4. Sittasomus olivaceus (Wied).

Un mâle adulte de Lechugal, tué le 17 mars.

5. Synallaxis stictothorax, Scl.

Un exemplaire de Tumbez.

6. Synallaxis tithys, n. sp.

Supra fusco-grisea, subtus cinerea; capite gulaque schistaceis, abdomine medio albido; alæ et cauda fuscæ, tectricibus alarum vivide cinnamomeis, subalaribus albis. Rostrum nigricans, pedes cornei, iris castanea. Long. tota 138 *mill., alæ* 57, *caudæ* 62, *rostri a commissura* 17, *tarsi* 18.

La femelle unique fournie par M. Stolzmann de Lechugal est d'une

couleur grise brunâtre au dos, à tête ardoise beaucoup plus foncée ; la gorge ardoise avec un lustre soyeux et finement striée de blanchâtre au menton ; le dessous du corps gris cendré et blanchâtre au milieu du ventre. Les ailes et la queue brunes foncées ; les couvertures alaires d'un roux cannelle clair et uniforme sur tout le devant de l'aile ; remiges secondaires largement bordées de roussâtre ; subalaires blanches avec une légère nuance isabelle.

La queue de cet exemplaire est incomplète, mais distinctement fort étagée et à 10 rectrices ; la différence entre les rectrices latérales et les médianes est de 38 mill.

Formicariidæ.

1. Thamnophilus albinuchalis, Scl. P. Z. S. 1855, p. 18.

Deux mâles et une femelle de Tumbez, tués en janvier et en juin. Iris du mâle brun grisâtre foncé, celui de la femelle brun foncé.

2. Thamnophilus transandeanus, Scl.

Une femelle prise à Tumbez dans un piége à souris, le 28 juin. Iris orangé.

Tyrannidæ.

1. Ochthœca salvini, n. sp.

Supra fusco-grisea, subtus lutea ; pileo, loris, genisque nigro-schistaceis ; fronte superciliisque latis luteis ; alis caudaque nigricantibus ; fascia lata alari alba ; remigibus albo limbatis et terminatis ; pogonio externo rectricum primi et secundi paris albo. Rostrum nigrum ; pedes plumbeo-nigricantes ; iris fusco-brunnea. Long. tota 125 *mill., alæ* 68, *caudæ* 60, *rostri a commissura* 15, *tarsi* 18.

Dessus de la tête, les lores et les côtés du visage sont d'un noir ardoise foncé ; une teinte moins foncée et prenant un ton olivâtre couvre toutes les parties supérieures du corps ; le front et une bande sourcilière très-large s'étendant jusque sur le derrière de la tête sont d'une couleur jaune de serin, ainsi que tout le dessous du corps, excepté les côtés du ventre, qui sont grisâtres, le bas ventre, les subalaires et les subcaudales, qui sont d'un jaune blanchâtre. Les ailes et la queue sont noirâtres ; une large bande blanche légèrement lavée de jaunâtre traverse l'aile en occupant les extrémités des grandes couvertures ; toutes les remiges ont des bordures blanches, très-fines sur les primaires, et plus larges sur les secondaires ; les extrémités mêmes des pennes sont aussi entourées de la même couleur ; le bord interne des remiges est blanc nuancé légèrement de jaunâtre ; la barbe externe des rectrices latérales blanche en entier, sur celle de la seconde paire le blanc s'arrête à une petite distance du bout de la plume, sur les suivantes cet couleur s'arrête de plus en plus près de la naissance et est teinte de jaunâtre ; les médianes toutes noires ; les extrémités mêmes des rectrices sont terminées d'une fine bordure blanche.

Cet oiseau a à peu près la taille de *O. lessoni*, il a le bec un peu plus fort et plus long que dans l'espèce citée.

Trois mâles des environs de Tumbez, tués en janvier et en juillet.

2. Fluvicola atripennis, Scl. P. Z. S. 1860, p. 280.

Un exemplaire tué sur l'étang Pozo de Lambedero le 25 mars. Iris brun foncé.

3. Muscigralla brevicauda, Lafr. et Orb.

Un exemplaire de Tumbez. Iris terre-de-Sienne.

4. Todirostrum cinereum (L.).

Un exemplaire de Tumbez.

5. Euscarthmus fulviceps, Scl. P. Z. S. 1871, p. 497.

Un exemplaire de Tumbez. Iris brun foncé.

6. Phyllomyias tumbezana, n. sp.

Supra fusco-grisea, subtus albida, ventre toto flavicante pallidissime perfuso, pectore lateribusque griseo tinctis, loris superciliisque cinereo-albidis; alæ et cauda dorso concolores, remigibus rectricibusque albido limbatis; tectricibus alarum binis fasciis latis pallidis ornatis; pogonio externo rectricis lateralis pallido. Rostrum nigrum, pedes nigricantes, iris fusco-brunnea. Long. tota 120 *mill., alæ* 60, *caudæ* 56, *rostri a commissura* 14, *tarsi* 20.

Cet oiseau ressemble beaucoup au *P. semifusca*, Scl., mais il est d'une taille un peu plus forte, et s'en distingue par la couleur des parties supérieures du corps grise brunâtre foncée sans aucune trace de nuance olivâtre; la couleur de l'abdomen, des subcaudales, et des tectrices subalaires blanchâtre induite de jaunâtre à peine distinct. Les lores et la bande sourcilière d'un cendré clair; les remiges et les rectrices bordées finement de blanchâtre, avec une nuance jaunâtre très-faible; la barbe externe des rectrices latérales est blanchâtre sâle dans toute sa largeur; également comme dans l'espèce citée des larges bordures des grandes couvertures alaires constituent deux larges bandes d'un fauve roussâtre. Bec noir, pattes noirâtres, iris brun foncé.

3e et 4e remiges les plus longues et égales, 5e égale à la 2e, 1re à la 8me.

Deux individus de Tumbez, dont un mâle tué le 7 mars, et l'autre, sans indication de sexe, tué le 10 février.

7. Eupsilostoma pusillum, Scl.

Une exemplaire de Tumbez.

8. Elainea placens, Scl.

Une paire de Lechugal.

9. Elainea leucospodia, n. sp.

Supra grisea, pileo fusco, crista interna alba; loris annuloque oculari albo; gula alba, abdomine albido, hypochondriis griseis, subcaudalibus flavicantibus; alæ et cauda fuscæ, remigibus extus anguste albo limbatis, tectricibus griseo marginatis, rec-

trice laterali tota albida. Rostri nigricantis mandibula inferior pallida; pedes nigricantes; iris fusco-brunnea. Long. tota 113 *mill., alæ* 62, *caudæ* 51, *rostri a commissura* 13, *tarsi* 20.

Dos gris, légèrement olivâtre; sommet de la tête comme dans l'*E. modesta* et beaucoup d'autres, plus foncé, à huppe blanche intérieurement; les lores et le tour des yeux blancs; parties inférieures du corps blanchâtres, côtés du cou, de la poitrine et du ventre gris; le blanc de l'abdomen induit légérement d'isabelle; les subcaudales et les subalaires colorées de jaune très-faible. Les ailes et la queue un peu plus foncées que le dos; les remiges et les rectrices finement bordées de blanchâtre; le bord interne des remiges blanc; les rectrices latérales blanchâtres en entier; tectrices alaires largement bordées de gris. Bec noirâtre à mandibule inférieure pâle; pattes noirâtres; iris brun foncé. Taille de l'*E. caniceps*.

Exemplaire unique sans indication de sexe de Tumbez, tué le 10 février.

10. Myiozetetes similis (Spix).

Un exemplaire de Tumbez, tué le 23 juin. Iris d'un chocolat grisâtre.

11. Rhynchocyclus sulphurescens (Spix).

Une paire de Lechugal.

12. Myiodynastes audax (Gm.).

Un exemplaire de Lechugal, tué le 25 février. Iris brun foncé.

13. Myiodynastes atrifrons, Scl. P. Z. S. 1859, p. 73.

Trois exemplaires de Tumbez, tués à la fin de janvier et au commencement de mars. Iris brun foncé.

14. Myiobius crypterythrus, Scl. P. Z. S. 1860, p. 474.

Une paire de Tumbez, tuée à la fin de janvier. Iris brun foncé.

15. Pyrocephalus rubineus (Bodd.).

Quatre exemplaires de Tumbez.

16. Myiarchus phæocephalus, Scl. P. Z. S. 1860, p. 281.

Un exemplaire de Lechugal. Iris brun foncé.

17. Tyrannus melancholicus, Vieill.

Un oiseau tué entre Tumbez et Santa Luzia.

18. Tyrannus niveigularis, Scl.

Une paire de Tumbez, tuée le 10 janvier et le 28 février. Iris brun foncé.

Cotingidæ.

1. Hadrostomus homochrous, Scl. P. Z. S. 1859, p. 142.

Quatre mâles en différents plumages et une femelle de Lechugal. Iris brun foncé.

2. Callopsaris albogriseus (Scl.), P. Z. S. 1857, p. 78.

Deux femelles de Lechugal. Iris brun foncé.

Trochilidæ.

1. Acestrura micrura (Gould). Introd. Monogr. Troch. p. 920.

Un mâle de Tumbez.

2. Amazilia leucophæa, Reichb.; Gould, Monogr. Troch. v. pl. ccevi.

Un mâle de Tumbez.

Caprimulgidæ.

1. Chordeiles acutus, Cass.

Un exemplaire de Tumbez.

2. Nyctidromus albicollis (Gm.).

Un jeune oiseau de Lechugal.

Picidæ.

1. Chloronerpes callonotus (Waterh.).

Une paire (♂ et ♀) tuée dans les algarrobes des environs de Tumbez, le 10 janvier et le 1 mars. La couleur des yeux est indiquée dans le mâle, gris-brunâtre, et d'un gris-violet foncé dans la femelle. Les côtés de la gorge, la poitrine, les côtés de l'abdomen et les subcaudales ont dans les deux individus des stries transversales foncées bien distinctes, ce qui n'est pas mentionné dans la description de Waterhouse, ni dans celle de Lafresnaye.

2. Chloronerpes canipileus (Orb.).

Deux mâles de Tumbez et de Lechugal. Iris brun foncé.

3. Picumnus sclateri, n. sp.

♀. *Supra murinus, fusco albidoque obsolete transfasciatus, pileo nigro albo guttulato; subtus albidus, collo pectoreque nigricanti transfasciatis, abdomine longitudinaliter fusco maculato; alæ fuscæ, remigibus pallide limbatis; cauda nigra, pogonio interno rectricum mediarum albo; subalaribus albis. Rostrum plumbeo-nigricans; pedes plumbei; iris fusco-brunnea. Long. tota* 85 *mill., alæ* 53, *caudæ* 31, *rostri a commissura* 17, *tarsi* 12.

Ce picumne, dont une femelle m'a été fournie de Lechugal, ressemble beaucoup au *P. cirrhatus*, Temm., il a également le dos gris de souris, rayé transversalement d'une nuance un peu plus foncée et de blanchâtre; mais cette dernière est moins distincte que dans l'espèce citée. Le dessus de la tête est noir, maculé de gouttelettes blanches, beaucoup plus grandes que celles de l'espèce citée, et de toutes les autres; le croupion est également blanchâtre varié de foncé. Le fond de tout le dessous du corps est blanc, rayé transversalement de noirâtre sur la gorge et sur la poitrine, de sorte que

les raies foncées et les blanches sont à peu près également larges, tandis que les raies foncées de l'abdomen, aussi larges, sont disposées dans le sens de la longueur du corps ; il y a aussi au milieu du ventre des petites stries transversales, mais peu significantes. Les plumes couvrant les narines sont blanches pures, tandis qu'elles sont rousses dans le *P. cirrhatus*. Les ailes sont plus foncées que le dos à remiges primaires bordées finement d'une nuance plus claire ; les bordures des secondaires et surtout celles des tertiaires sont beaucoup plus larges et d'une couleur fauve blanchâtre ; les couvertures alaires sont entourées d'une bordure foncée très-subtile ; les subalaires, ainsi que les bords internes des remiges, blanches. La queue est noire à barbe interne des rectrices médianes blanche en entier.

Le bec de cet oiseau est moins fort que dans le *P. cirrhatus*, la base de la mandibule inférieure plombée, tandis que dans ce dernier elle est d'une nuance bien différente de son extrémité.

Il diffère aussi du *P. temminckii* Lafr. par la couleur du dos, qui n'a rien de verdâtre, et par la direction des raies abdominales, ainsi que par la couleur du bec, qui dans l'espèce citée est gris jaunâtre.

Alcedinidæ.

1. Ceryle cabanisi (Tsch.).
Une femelle de Lechugal.

2. Ceryle torquata (L.).
Un mâle de Lechugal.

Momotidæ.

Momotus microstephanus (Cab.) ; Mus. Hein. ii. p. 114.
Une femelle de Lechugal. Iris brun foncé.

Trogonidæ.

1. Trogon melanurus, Sws.
Un mâle de Lechugal. Iris blanc.

2. Trogon caligatus, Gould.
Une femelle de Lechugal. Iris brun foncé.

Cuculidæ.

1. Crotophaga sulcirostris, Sws.
Un exemplaire de Tumbez.

2. Piaya nigricrissa, Scl. P. Z. S. 1860, p. 285.
Un exemplaire de Lechugal. Iris rouge cerise.

3. Coccyzus erythrophthalmus (Wils.).
Un exemplaire du Lechugal. Iris gris brunâtre très-foncé.

Psittacidæ.

1. Conurus erythrogenys (Less.).
Un mâle de Tumbez.

2. Brotogerys pyrrhoptera (Lath.).

Un exemplaire de Lechugal. Iris brun foncé.

3. Psittacula cœlestis (Less.).

Quatre exemplaires de Tumbez, où l'oiseau est très-commun. Iris brun.

Falconidæ.

1. Urubitinga anthracina (Nitzsch).

Un exemplaire adulte de Lechugal.

2. Urubitinga unicincta (Temm.).

Un jeune oiseau de Santa Luzia.

3. Herpetotheres cachinnans, Vieill.

Un exemplaire de Lechugal.

4. Geranospiza cærulescens (Vieill.).

Deux mâles tués à Lechugal le 5 avril. Iris de l'oiseau adulte est brun avec une bordure jaune très-fine ; celui du plus jeune est brun rougeâtre.

5. Accipiter bicolor (Vieill.).

Une femelle de Tumbez tuée le 19 juin. Iris jaune clair ; la cire et le tour des paupières jaunes ; pattes jaunes orangées.

6. Ictinia plumbea (Vieill.).

Un jeune oiseau de Lechugal.

Strigidæ.

Glaucidium phalænoides (Daud.).

Un exemplaire de Tumbez.

Ardeidæ.

Nycticorax gardeni (Gm.).

Un jeune exemplaire en plumage de transition de Lechugal. Iris rouge.

Columbidæ.

Peristera cinerea (Temm.).

Un mâle de Lechugal. Iris composée d'un anneau extérieur large d'une couleur rose-violette, suivi d'un autre anneau gris très-étroit ; ensuite l'interne également subtil est fauve.

Rallidæ.

Parra jacana (L.).

Un mâle de l'étang Pozo de Lambedero.

CHARADRIIDÆ.

1. ÆGIALITIS WILSONIANA (Orb.).
Un exemplaire tué entre Tumbez et Santa Luzia.

2. SQUATAROLA HELVETICA (L.).
Un exemplaire de Chimbote.

SCOLOPACIDÆ.

1. TOTANUS CHLOROPYGIUS, Vieill.
Un exemplaire de Lechugal. Iris brun foncé.

2. ACTITIS MACULARIA (L.).
Un jeune oiseau de Tumbez.

3. PHALAROPUS HYPERBOREUS, L.
Un oiseau en plumage d'hiver tué à Tumbez le 28 janvier.

4. TRINGA MINUTILLA (Vieill.).
Un exemplaire tué entre Tumbez et Santa Luzia.

5. NUMENIUS HUDSONICUS (Lath.).
Plusieurs exemplaires de Chimbote et de Santa Luzia.

PHŒNICOPTERIDÆ.

PHŒNICOPTERUS IGNIPALLIATUS (Geoff. et Orb.).
Un exemplaire de la delte de Tumbez.

Sur les 92 espèces provenant de cette contrée il y a 72 qui n'ont pas été fournies par M. Jelski de toutes les localités du Pérou central qu'il a visité précédemment. Un certain nombre de ces espèces a été déjà trouvé dans le pays par d'autres voyageurs, il reste cependant un nombre assez considérables de formes à introduire pour la première fois dans la faune péruvienne.

En comparant cette liste avec celle du Pérou central de M. Jelski, on voit une grande différence dans la richesse de certaines familles. La famille de Tanagrides si abondante en espèces au Pérou central, n'est représentée dans ce dernier envoi que par 3 formes ; on peut dire le même des Colibris et des Formicariides. Au contraire le groupe des Ictérides y paraît être beaucoup plus abondant. M. Jelski, de toutes les localités du Pérou central qu'il a visité, n'a fourni que 6 espèces, tandis qu'on en a envoyé 9 de ce dernier territoire restreint, voisin de l'Equadeur. Les groupes des Fringillides et des Tyrannides y paraissent être aussi nombreux comme dans le Pérou central. Toutes ces suppositions pourront être changées quand nos explorateurs auront visité les montagnes voisines.

À la liste précédente des oiseaux recueillis par M. Jelski au Pérou central, on peut ajouter les deux espèces suivantes :—

PORZANA ERYTHROPS, Scl. P. Z. S. 1867, p. 373, f. xxi.
Un mâle des environs de Lima.

Parmi les merles des localités précédentes il y a un mâle adulte de Ropaybamba, bien différent du *Turdus serranus*, Tschud., et qui me paraît être inédit; je présente donc sa description:

TURDUS LEUCOPS, n. sp.

Nigerrimus unicolor, rostro pedibusque flavis, iride sordide alba, cauda mediocri æquali; remige tertio longissimo, primæ tectricarum æquali.

Ce merle est beaucoup plus petit et très-différent du *T. serranus* Tsch.; sa queue est beaucoup plus courte, coupée presque carrément à l'extrémité, de sorte que les rectrices externes sont seulement de deux mill. plus courtes que les autres, qui sont égales entre elles, tandis que dans le *T. serranus* la queue est beaucoup plus longue, à rectrices beaucoup plus larges et fort arrondie à l'extrémité, la rectrice externe est de 8 mill. plus courte que la suivante, et de 16 mill. moins longue que les médianes. La proportion des remiges externes est autre; la 1re est étroite et égale aux grandes couvertures, tandis qu'elle est beaucoup plus longue dans l'espèce citée; la 3e est la plus longue, la 4e un peu plus courte, et un peu plus longue que la 5e, la 2e plus courte que la 6e et beaucoup plus longue que la 7e. Dans le *T. serranus* c'est la 4e qui est la plus longue, et la 2e presque égale à la 7e.

Le bec est beaucoup plus court; les pattes plus courtes et plus faibles. Le noir de la couleur générale est très-intense dans cette nouvelle espèce, avec un éclat bleuâtre bien distinct, presque uniforme sur toutes les parties du corps. Le bec est jaune de cire; les pattes et les ongles d'un jaune plus pâle et plus uniforme que dans le *T. serranus*; l'iris est d'un blanc sâle.

Dimensions comparatives des deux formes:—

	T. leucops.	*T. serranus.*
	millim.	millim.
Longueur de l'aile pliée	120	130
„ de la queue	85	114
„ du bec depuis la commissure	22	28
„ du bec depuis les narines ..	11	13
„ du tarse	27	34
„ du doigt médian sans ongle	22	24

Nos voyageurs ont aussi fait une excursion de quelques semaines dans une forêt vierge nommée Palmal, située sur le territoire de l'Equadeur, dans le district de Santa Rosa, province de Guayaquil, éloignée seulement de 4 heures de Lechugal. M. Stolzmann a envoyé de cette forêt les espèces suivantes, et prétend que la faune ornithologique de cette localité est bien différente de celle des environs de Tumbez et de Lechugal.

BASILEUTERUS UROPYGIALIS, Scl.

Mâle adulte et un jeune.

Ramphocelus icteronotus, Bp.

Une paire (♂, ♀) d'oiseaux adultes, tués à la fin d'avril et au commencement de mai. Iris du mâle brun rougeâtre, celui de la femelle brun grisâtre foncé.

Tachyphonus luctuosus, Lafr. et Orb.

Un mâle adulte.

Arremon spectabilis, Scl. P. Z. S. 1854, p. 114, t. lxvii.

Un mâle adulte, tué le 30 avril. Iris brun clair.

Saltator magnus (Gm.).

Un exemplaire.

Embernagra chrysoma, Scl. P. Z. S. 1860, p. 275.

Un exemplaire tué le 20 mai. Iris brun rougeâtre.

Pyranga azaræ, Orb.

Une femelle.

Sittasomus olivaceus (Wied).

Un jeune mâle.

Dendrocincla atrirostris (Lafr.).

Un exemplaire tué le 3 avril. Iris gris.

Thamnophilus cæsius, Licht.

Un mâle adulte.

Pyrocephalus rubineus (Bodd.).

Un mâle adulte, aussi petit comme ceux des environs de Tumbez.

Platyrhynchus albigularis, Scl.

Une femelle.

Megalophus æquatorialis (Scl.).

Une femelle adulte.

Myiobius barbatus (Gm.).

Un exemplaire. M. Stolzmann dit que cet oiseau a l'habitude de porter sa queue étendue en éventail.

Orchilus pileatus (Tsch.).

Un exemplaire.

Heteropelma wallacii, Scl.

Un exemplaire.

Juliamyia feliciana (Less.).

Trois femelles.

CERYLE INDA (L.).
Un jeune oiseau.

MALACOPTILA PANAMENSIS (Lafr.).
Un adulte et un jeune. Iris de l'oiseau adulte est rouge de sang, celui du jeune blanc sâle.

PIAYA RUTILA (Ill.).
Un exemplaire.

BROTOGERYS PYRRHOPTERA (Lath.).
Une femelle.

ACCIPITER BICOLOR (Vieill.).
Une femelle adulte tuée le 18 mai. Iris d'une belle couleur jaune.

ORTALIDA ERYTHROPTERA, Scl. et Salv. P. Z. S. 1875, p. 540.
Un exemplaire. Iris brun.

Selon l'opinion exprimée dans la lettre de M. Stolzmann on peut considérer la faune de Lechugal comme intermédiaire entre celles de Tumbez et de Palmal, quoique nos voyageurs y ont trouvé beaucoup d'espèces qu'ils n'ont pas observées dans les deux dernières localités. La différence parmi les faunes de Tumbez et de Palmal est si grande qu'on peut à peine citer quelques espèces communes, comme *Ceryle cabanisii, Picolaptes souleyeti, Accipiter bicolor, Todirostrum cinereum, Myiozetetes similis, Polioptila albilora, Prionites microstephanus, Furnarius cinnamomeus, Myiarchus rubineus, Campylorhynchus balteatus, Cairina moschata.* Il suppose aussi que les trois avant-derniers oiseaux se sont établis dans le Palmal depuis qu'on a défriché le terrain pour l'établissement des *chacras* (morceaux de terre cultivée au fond de la forêt).

3. Some Notes on the Madeiran Mollusk identified by the Rev. R. T. Lowe as *Achatina folliculus*, Gron. By the Rev. R. Boog WATSON, F.R.S.E., F.G.S.

[Received March 19, 1877.]

In December 1875 I had the honour of presenting to the Zoological Society a paper "On the Generic Peculiarities of the distinctively Madeiran *Achatinæ* of Lowe"*. These peculiarities are:—1st, the extension of the mantle over the shell; and, 2nd, the presence of a mucous gland in the abruptly truncate tail. On the strength of these peculiarities I proposed the formation of a separate genus, under the name of *Lovea*, for this group, to which, from the examination of the animals, I was able to attach *Lovea* (*Achatina*) *melampoides*, Lowe, *L. tornatellina*, Lowe, *L. triticea*, Lowe, and *L. oryza*, Lowe; and I added my belief that these generic features would be "found common to all the distinctively Madeiran species of this group. Of course *Achatina acicula* and *Cochlicopa lubrica* (the *maderensis* of Lowe) fall off from it; for they certainly have not the

* See P. Z. S. 1875, p. 677.

characteristics of the genus;" and I went on to ask "Does the *Achatina folliculus*, Gron., a common European species, belong to this new genus or not? Surely, had it possessed the generic peculiarities mentioned above, the fact would long ago have been noticed. I have not yet been able to decide the question as regards the Madeiran species identified by Lowe as the *Achatina folliculus*, Gron."

I have at last, through the kindness of Mr. T. Vernon Wollaston and Mr. João Maria Moniz, been enabled to examine the living animal of the Madeiran species, and have, as I expected, found it to possess the generic features of *Lovea* as given above. It thus becomes increasingly desirable that some one who has the opportunity would make careful examination of the *Achatina folliculus*, Gron., in order to ascertain whether it presents these same generic features or not. In the mean time the identification of the Madeiran and the South-European species, based on the undeniable similarity of the shells, must be regarded as doubtful; and I propose for the Madeiran species the name of *Lovea wollastoni*, of which I have now to present the description.

Body. In general form very much like that of *Lovea tornatellina*, Lowe.

Colour. Yellow, towards the tail slightly orange, towards the head with a faint tinge of grey, which is darker towards the end of the tentacles. The sole of the foot is lemon-coloured, which is a little more translucent in front. A very slightly greyer line runs above the edge of the foot in front.

Mantle yellow, but a little whiter and less translucent, having a few whitish granules scattered in it. It spreads round and beyond the shell-edge; but my specimens had been long in captivity, were dry and unhappy, and thus the mantle was probably less extended than would normally be the case.

Tentacles. Upper long, very fine; lower short.

Sides scored with long tubercles, of which those above are long and narrow, stretching from above forwards and downwards; the others below and behind these first are squarer in shape, and stretch from before obliquely backwards. The head, neck, and tentacles are finely tubercled. The foot is bordered by a narrow line, above which is a fringe of squarish-shaped tubercles. Two close-set and well-marked lines of tubercles run backward from between the tentacles along the neck.

Seen from above, the *tail* ends in an attenuated blunt rounded point; seen in profile, it is abruptly cut off obliquely, the extreme upper corner being occupied by the mucous gland, the opening of which is covered by a flap which, when depressed, almost obscures that feature, but which, when the animal is in full vigour, is elevated into a short, sharp, triangular, projecting point.

Mr. Wollaston, in sending me these specimens, writes that Mr. Moniz "says that he obtained them with great difficulty, and, as usual, in S. Gonçalo parish."

In that locality alone have I ever found them, among the dead leaves of the *Opuntia tuna*.

4. List of Birds met with in North-eastern Queensland, chiefly at Rockingham Bay. By E. Pierson Ramsay, F.L.S. &c., Curator of the Australian Museum, Sydney. —Part III.[1]

[Received March 21, 1877.]

198. Choriotis australis.

Choriotis australis, Gould, Handbk. B. A. ii. p. 208.

Usually found on the open parts of the grass flats: this bird is not plentiful near Rockingham Bay; I met with it only on two or three occasions. I have described the eggs of this species in 'The Ibis,' 1867, p. 418.

199. Œdicnemus grallarius.

Œdicnemus grallarius, Gould, Handbk. B. A. ii. p. 210.

The Stone-Plovers, or "Land-Curlews" as they are more commonly called, are very plentiful all over the district, both inland and on the sea-coast. A curious variety of the egg of this species is sometimes found; it is of a rich creamy buff, clouded with a duller tint, or irregularly and indistinctly blotched with dull brownish buff. On showing some of this variety to the late Mr. John Macgillivray, author of the 'Voyage of the Rattlesnake' &c., he assured me they were so remarkably similar to the one found by the late Commander J. M. R. Ince at Port Essington, and described by Mr. Gould[2] as that of *Esacus magnirostris*, that no doubt as to their identity remained in his mind. On every occasion that I have obtained the buff-coloured egg the accompanying one was of the usual heavily blotched variety, with but few markings at the thin end. This species never lays more than two eggs for a sitting, which vary a good deal in different localities. There are four very distinct varieties in the Dobroyde collection.

200. Esacus magnirostris.

Esacus magnirostris, Gould, Handbk. B. Austr. ii. p. 213.

A pair of these interesting birds frequented the sand-pits in the neighbourhood of Cardwell during the time of my visit; they proved too wary to be approached within gun-shot; the white on the wings shows very conspicuously in flight. It is not a rare species, but always very difficult to obtain when found near any of the settlements.

201. Lobivanellus lobatus (?).

Lobivanellus lobatus, Gould, Handbk. B. A. ii. p. 218.

I heard the cry of a Plover of this genus on one or two occasions, but had no opportunity of ascertaining for certain which species it

[1] Continued from P. Z. S. 1876, p. 123, and concluded.
[2] Handbk. Birds Austr. ii. p. 213.

was; the bird may have been *Lobivanellus personatus*, but more probably *L. lobatus*. The cry of the latter is well known to me; that of the former, to my knowledge, I never heard. I have been informed by Inspector Robert Johnstone, of the Herbert River, that Spur-wing Plovers occasionally visit that district. The eggs of *Lobivanellus lobatus* vary from rich *dark green* to *olive-brown*, with blackish spots and blotches.

202. SARCIOPHORUS PECTORALIS.

Sarciophorus pectoralis, Gould, Handbk. B. Austr. ii. p. 222.

I met with this species only on one occasion, about fifty miles inland, while enjoying the hospitality of Mr. Stone, Superintendent of "The Vale of the Herbert" station, the property of Walter Scott, Esq. In the extensive and well-grassed paddocks around the station a flock of these birds had taken up their abode. Mr. Stone informed me that they remain in the neighbourhood throughout the whole year; and being seldom if ever molested, they showed no symptoms of fear, quietly remaining while I walked within a few feet of them.

203. CHARADRIUS LONGIPES.

Charadrius longipes, Gould, Handbk. B. Austr. ii. p. 225.

I enumerate this species on the authority of Inspector Johnstone, who informs me the Golden Plover visits the Herbert district every winter.

204. ÆGIALITIS NIGRIFRONS.

Ægialitis nigrifrons, Cuvier; Gould, Handbk. B. Austr. ii. p. 232.

This species is not uncommon on the Herbert river, and is found dispersed over the whole of the eastern and southern portions of Australia, even venturing far inland. I have met with it high up on the Bogan and Bell rivers, and on the Murrumbidgee river, near Yass; it gives preference to the margins of inland lakes and lagoons rather than the sea-coast. J. S. Ramsay, Esq., a most persevering and successful oologist, found it breeding during the months of October, November, and December on the margins of the Bell river, at Cardington. There was always a difficulty in discovering the eggs, from their similarity to the adjacent ground on which they were laid, it being necessary to watch the birds to their eggs. James Ramsay, Esq., of Nanama, near Yass, has also sent me authentic eggs of this species, taken in that district, while others which I have received from Melbourne and South Australia all exhibit a similar style and colour in their markings. The eggs are always four in number, and usually placed with the thinner ends together, in a slight depression in the sand or pebbles near water; the ground-colour is of a rich creamy white when fresh, nearly obscured by numerous irregular angular markings and hair-lines of blackish brown, dark brown, and bluish slate-colour, the last appearing as if beneath the surface of the shell. In some specimens these markings are close together, giving a clouded appearance to the eggs, in others

about equally dispersed over the whole surface. In some light varieties they are less numerous at the thinner end; and these specimens are slightly smaller in size. Length 1·05 inch by 0·8 inch; the darker and most usual variety 1·1 inch in length by 0·85 inch in breadth.

205. ÆGIALITIS RUFICAPILLA.

Ægialitis ruficapilla, Gould, Handbk. B. Austr. ii. p. 235.

Unlike the preceding, this species is seldom found far from the sea; they frequent the sands and open salt-water flats, and are usually met with in small troops from five to ten in number; the nest (if it may be so called) is like all others of the genus I have met with, merely a slight depression in the sand or pebbles close to high-water mark; sometimes the eggs are placed among débris containing broken shells and coral &c., above the influence of the tide; they are usually four, but sometimes three, and occasionally only two (but four, I presume, is the correct number for a sitting), placed with the pointed ends together; and without any protection except that afforded them by their similarity to the surrounding objects among which they have been deposited, they are very difficult to be detected. Our collection contains eggs taken at Woolongong and various parts of the sea-coast of New South Wales, also from near Melbourne; but none show any material difference in coloration or form; in size they are slightly larger than those of *Ægialitis nigrifrons*, being 1·2 inch to 1·25 inch in length by 0·93 to 0·94 in breadth, of a light pale stone-brown or very light cream-colour, spotted sparingly with black dots and rather large irregular black blotches and markings, a few of the dots appearing as if beneath the surface of the shell.

They breed from October to December, and sometimes as late as January.

206. ÆGIALITIS INORNATA.

Ochthodromus inornatus, Gould, Handbk. B. Austr. ii. p. 237.

207. ÆGIALITIS BICINCTA.

Ochthodromus? bicinctus, Gould, Handbk. B. Austr. ii. p. 238.

Only once did I meet with these species—of the former a small troop on the sand-spits of the Herbert river; of the latter, one solitary bird remained for a few days on the sands in front of the settlement at Cardwell.

208. HIMANTOPUS LEUCOCEPHALUS.

Himantopus leucocephalus, Gould, Handb. B. Austr. ii. p. 246.

While ascending the Herbert river on the 25th of February 1874, and anxiously waiting for a stray shot at an Alligator (*Crocodilus biporcatus*), I met with the only specimen of this bird I noticed during my tour. Firing at the bird I disturbed the Saurian, much to the disgust of my companions, as this identical Alligator had of late

been helping himself rather freely to some of the Kanakas employed on the sugar-plantations. A few days afterwards, however, while returning from an unsuccessful Cassowary-hunt, I had the pleasure of seeing Inspector Johnstone dispatch the beast as it lay, with open mouth, on a sand-spit.

Mr. Johnstone informed me that the Stilted Plover was a very rare bird in that district; but, from the nature of the country and the extensive swampy flats and numerous lagoons, I should have thought the contrary was the case; however, although I remained in the district all through the wet season, I met with no other specimen. The eggs of this species will be found described in a previous number of the Society's 'Proceedings,' 1867, p. 600.

209. RECURVIROSTRA RUBRICOLLIS.

Recurvirostris rubricollis, Gould, Handbk. B. Austr. ii. p. 249.

This bird is very local in its habits, and never seems to be very plentiful in any part of the continent; it is met with occasionally in large flocks; and Inspector Johnstone informs me it sometimes is met with on the Lower Herbert. One or two were observed during my visit; but I failed to obtain any specimens.

210. LIMOSA UROPYGIALIS.

Limosa uropygialis, Gould, Handbk. B. Austr. ii. p. 252.

Very numerous on mud-flats and sand-spits at the mouth of the Herbert river.

211. LIMNOCINCLUS ACUMINATUS.

Limnocinclus acuminatus, Gould, Handbk. B. Austr. ii. p. 254.

A very common species, frequenting the margins of lagoons and swampy places in large flocks sometimes consisting of several hundred individuals.

212. TRINGA TENUIROSTRIS.

Tringa tenuirostris, Gould, Handbk. B. Austr. ii. p. 260.

I met with a small flock of this species on one occasion only, on the banks of the Herbert.

213. ACTITIS HYPOLEUCUS.

Actitis hypoleucus, Gould, Handbk. B. Austr. ii. p. 263.

I met with this pretty little Sandpiper but once, on the Herbert river, near the police camp.

214. GLOTTIS GLOTTOIDES.

Glottis glottoides, Gould, Handbk. B. Austr. ii. p. 265.

Common everywhere on margins of lagoons and mud-flats; usually found in small flocks from ten to twenty in number.

215. STREPSILAS INTERPRES.

Strepsilas interpres, Gould, Handbk. B. Austr. ii. p. 269.

The Turnstone is usually considered a rare species; and it certainly

is so in collections made in New South Wales. I found large flocks of Sandpipers, and among them a few of this species, on the extensive mud-flats at the mouths of the Mary and Fitzroy rivers, and had ample opportunities of watching their habits while stranded in a boat, high and dry, about the middle of an extensive mud-flat, thirty miles long by six miles wide. I spent the best part of a day in this position, waiting for the return of the tide, and, per force, amused myself watching the different species of Waders and Gulls, many of which came within a few yards of our boat.

216. GALLINAGO AUSTRALIS.

Gallinago australis, Gould, Handbk. B. Austr. ii. p. 271.

The Australian Snipe affords good shooting to the sportsman during the season. There were not many of this species in the Herbert district during my visit; but the few we obtained were among the finest and largest I have ever met with.

217. RHYNCHÆA AUSTRALIS.

Rhynchæa australis, Gould, Handbk. B. Austr. ii. p. 274.

That this species occasionally visits the districts near Rockingham Bay is proved by some fine specimens having been shot and skinned by Inspector Johnstone. These were procured a short time prior to my visit, and were still in his possession at the time of my sojourn under his hospitable roof.

The Painted Snipe is by no means a common bird; and although during an occasional very wet season this species may be obtained in tolerable numbers, yet its visits are very uncertain and few and far between. In New South Wales I have obtained specimens from the Clarence river and Lake George; but nowhere have I ever found it plentiful.

218. NUMENIUS CYANOPUS.

Numenius cyanopus, Gould, Handbk. B. Austr. ii. p. 277.

Common everywhere in suitable places and muddy flats along the coast, and occasionally may be found on the margins of lakes and lagoons inland a considerable distance.

219. NUMENIUS UROPYGIALIS.

Numenius uropygialis, Gould, Handbk. B. Austr. ii. p. 279.

220. NUMENIUS MINOR.

Numenius minor, Gould, Handbk. B. Austr. ii. p. 280.

I observed these species but once during my tour; and, under the same circumstances, I trust I shall not meet them again. Mud-flats are very interesting in their way, especially to the naturalist; but there can be too much of a good thing. Both species are dispersed rather plentifully over the whole of the southern and eastern portions of Australia; and I have received one specimen of *N. minor* from the Lower Darling river, shot on the margins of some of the numerous inland lakes.

221. CARPHIBIS SPINICOLLIS.

Carphibis spinicollis, Gould, Handbk. B. Austr. ii. p. 282.

Met with once only, during the wet season, on the Lower Herbert river, in small flocks.

222. THRESKIORNIS STRICTIPENNIS.

Threskiornis strictipennis, Gould, Handbk. B. Austr. ii. p. 284.

I found this species on an extensive mud-flat at the mouth of the Fitzroy river, and have also received specimens from Port Denison. Mr. Johnstone informed me that it occasionally visited the Herbert river.

223. IBIS (FALCINELLUS) IGNEUS.

Ibis (*Falcinellus*) *igneus*, Gould, Handbk. B. Anstr. ii. p. 286.

I give this species on the authority of Mr. Johnstone, whom I found well acquainted with the bird, and who had obtained a specimen a short time prior to my visit.

224. PLATALEA REGIA.

Platalea regia, Gould, Handbk. B. Austr. ii. p. 287.

225. PLATALEA FLAVIPES.

Platalea flavipes, Gould, Handbk. B. Austr. ii. p. 288.

These species are seldom met with in Northern Queensland. I have received *P. regia* from Port Denison, where it was considered a very rare bird; and *P. flavipes* was observed near the mouth of the river Fitzroy, a single specimen only.

Mr. Robert Johnstone informed me that Spoonbills were occasionally seen on the Upper Herbert river; but he did not identify the species with certainty.

226. GRUS AUSTRALASIANA.

Grus australasianus, Gould, Handbk. B. Austr. ii. p. 290.

"Native Companions" were found very plentiful in all the swamps in the Herbert district. Early in the morning their hoarse croaking cry was most frequently heard.

227. XENORHYNCHUS AUSTRALIS.

Xenorhynchus australis, Gould, Handbk. B. Austr. ii. p. 293.

Found in tolerable numbers, in pairs, throughout the district, particularly on the sand-spits and shallows of the Herbert river; they were very wary, and at all times difficult to approach. I was much amused watching a pair of these birds stalking round a large Crocodile sunning himself on one of the numerous sandbanks of the river—the birds carefully eyeing the Saurian, and the Saurian patiently waiting until one of them should come within the swing of his tail (of which the birds were careful to keep out of range). What excited their curiosity I cannot imagine; they must have seen dozens of Crocodiles in their time.

228. Ardea sumatrana.

Ardea sumatrana, Gould, Handbk. B. Austr. ii. p. 296.

I met with this species on several of the rivers and estuaries from Moreton Bay to Rockingham Bay; I noticed several of them in Wide Bay, have received specimens from Cleveland Bay, and also observed them at the mouth of the Fitzroy river and on the Herbert river.

I am indebted to my friend the late Charles Coxen, Esq., of Brisbane, for a fine specimen, shot on the Brisbane river; and I have observed them as far south as the Clarence river, where the late Mr. John Macgillivray obtained a specimen. This species is always difficult to obtain, frequenting the extensive mud-flats, where it is impossible to walk, and seldom coming within shot from the shore. A pair were observed, accompanied by two young, well able to fly, in the month of December, showing that this species breeds early in the year.

229. Ardea pacifica.

Ardea pacifica, Gould, Handbk. B. Austr. ii. p. 297.

Found (by no means rare, and dispersed usually singly or in pairs) over the whole district, in the neighbourhood of rivers and swamps, also occasionally on the sea-shore mud-flats. They were not difficult to approach; and numerous examples might have been obtained. This species appears to be distributed over the whole of the north-eastern, eastern, and southern portions of Australia; it is common in the Hunter district in New South Wales, and occasionally still found on the Paramatta river near Sydney, but more plentiful further south.

230. Ardea novæ-hollandiæ.

Ardea novæ-hollandiæ, Gould, Handbk. B. Austr. ii. p. 299.

Common everywhere along the coast as far north as Cardwell, and extending a considerable distance inland. The eggs are two in number, of a light bluish green colour; the nest is a rough structure of sticks, built in the larger forked branches of trees, often at a considerable distance from water.

231. Herodias alba.

Herodias alba, Gould, Handbk. B. Austr. ii. p. 301.

This is the common White Crane of New South Wales, and is found plentiful on the Hunter river, and sometimes on the shores of Port Jackson, but more plentiful to the north. I found it numerous in Wide Bay and Moreton Bay; and many were met with on the mud-flats at the mouths of the various rivers and creeks as far north as Cooktown. Its range extends to Cape York and New Guinea. I have always found them solitary or in pairs.

232. Herodias egrettoides.

Herodias egrettoides, Gould, Handbk. B. Austr. ii. p. 303.

This species is widely dispersed along the shores of Australia, and

is admirably adapted for its habits, abounding in extensive swamps and lagoons. I have also met with, I believe, the same species in New Zealand. They are still found to be not rare within a few miles of Sydney; but the Illawarra district is the great stronghold of this species.

237. BUTOROIDES FLAVICOLLIS.

Butoroides flavicollis, Gould, Handbk. B. Austr. ii. p. 315.

The yellow-necked Mangrove-Bittern is plentiful in situations suitable to its habits all over Queensland. I found this species more common there than in New South Wales. In the extensive mangrove swamps and mud flats at the mouth of the Herbert river it is one of the most common birds.

238. ARDETTA PUSILLA.

Ardetta pusilla, Gould, Handbk. B. Austr. ii. p. 319.

I am happy to report that this beautiful little species is still plentiful in the neighbourhood of Cleveland Bay and also in the Herbert-river district; from both places have I received specimens. The species was once tolerably numerous near Sydney; and there are still specimens in the Dobroyde collection which were shot at Botany Bay and near Newtown. I observe no difference in plumage or size in the Northern Queensland specimens and those shot near Sydney.

239. PORPHYRIO MELANOTUS.

Porphyrio melanotus, Gould, Handbk. B. Austr. ii. p. 321.

Common all over the country, in similar situations to those frequented by it in New South Wales. The "Red-bill" prefers the swamps and extensive lagoons; but where such places are not met with readily, it takes to the banks and margins of the rivers. This species is easily domesticated, and, even in the wild state, when not disturbed, becomes very tame, entering the gardens and farm-yards and feeding with the poultry, to the young of which they prove very destructive. In certain parts of the country, where they are numerous, they do considerable damage to the crops, especially to the young maize. They are also very fond of the Indian corn when ripe: perching on the side of the stems, they detach the "cobs," which they hold steady on the ground with one foot while they pick off and eat the grains. I have seen them eating pieces of cooked and raw meat, holding them in the same way. The nest is a rough structure of rushes and water-weeds &c., placed among the reeds and sedges near the water, or built among reeds in the lagoons, at a considerable distance from the edge, just above water-mark. The eggs are from three to five in number, of a light brown or yellowish stone-colour, varying considerably in tint and in the shape of the markings, but usually spotted and blotched with umber, dark blackish brown, and slaty grey. The young are of a uniform blackish slate-colour on leaving the nest.

240. TRIBONYX VENTRALIS.

Tribonyx ventralis, Gould, Handbk. B. Austr. ii. p. 325.

I do not remember meeting with this species at Rockingham Bay; but I have received specimens from Port Denison (where, at certain seasons, it appears to be plentiful), some miles inland.

241. GALLINULA TENEBROSA.

Gallinula tenebrosa, Gould, Handbk. B. Austr. ii. 328.

Not so plentiful in any part of Queensland as in New South Wales. I found it, however, thinly distributed as far north as Rockingham Bay, in such situations as are preferred by the *Porphyrio melanotus*.

242. GALLINULA RUFICRISSA.

Gallinula ruficrissa, Gould, Suppl. Bds. Austr. vol. i. pl. 79.

A specimen of this rare species was obtained a few miles from Brisbane, in 1873.

I have also examined a skin obtained by Mr. A. Goldie at Port Moresby, New Guinea, the dimensions of which are as follows—total length 9·5 inches, wing 5·5, tail 2·5, tarsus 2, bill 1·2, middle toe 2, its nail 0·3, hind toe 0·75, its nail 0·35. The under tail-coverts are not so bright as in Mr. Gould's figure; and the back is of a more uniform tint.

243. PARRA GALLINACEA.

Parra gallinacea, Gould's Handbk. B. Austr, ii. p. 330.

This Parra is tolerably abundant throughout the swampy regions which abound over the eastern portion of Queensland and north-eastern parts of New South Wales. I have obtained specimens as far south as the Clarence river in New South Wales, its most southern limit, and as far north as the Herbert river in the Rockingham-Bay district. It is found most plentiful in the Rockhampton district wherever the swamps and lagoons occur; the leaves of the gigantic *Nymphæa* and *Nelumbium* afford a safe retreat for this species. I know of few more interesting or more pleasing sights than a troop of this handsome *Parra* wandering among the bright blue and crimson blooms of the giant waterlilies which abound in almost every sheet of water of any extent in North-eastern Queensland.

244. HYPOTÆNIDEA PHILIPPENSIS.

Hypotænidea philippensis, Gould, Handbk. B. Austr. ii. p. 334.

Universally dispersed over the whole of the Australian and South-Sea Islands, and particularly plentiful in the cane-fields of the sugar-growing districts of Queensland.

I have before me a very interesting variety of this species from one of the South Sea-Islands of the Fiji group which has the chin, throat, chest, and breast of a light ashy grey, with a few indistinct bars of slaty ash-colour or greyish slate on the chest and breast; the abdomen and flanks are much the same as in ordinary individuals of the same species; the bill is orange at the base of the lower man-

dible and on the outer margins of the upper. The Australian Museum has also obtained specimens from the Duke-of-York Island and New Ireland, as well as from the Samoan group: in some of the specimens from these last-mentioned islands, the pectoral band is altogether wanting; the same peculiarity occurs in some Fijian examples.

245. RALLINA TRICOLOR.

Rallina tricolor, Gould, Suppl. B. Austr. vol. i. pl. 78.

I have no other information to give on the habits of this species than that contained in my "Notes" in the Society's 'Proceedings' for 1875, p. 603, where will be found a description of the young and the eggs.

246. PORZANA FLUMINEA.

Porzana fluminea, Gould, Handbk. B. Austr. ii. p. 339.

247. PORZANA PALUSTRIS.

Porzana palustris, Gould, Handbk. B. Austr. ii. p. 340.

248. PORZANA TABUENSIS.

Porzana tabuensis, Gould, Handbk. B. Austr. ii. p. 341.

249. PORZANA (ERYTHRA) QUADRISTRIGATA.

Porzana (*Erythra*) *quadristrigata*, Gould, Handbk. B. Austr. ii. p. 343.

All except the first-mentioned of these species I have found by no means rare in Queensland. *P. quadristrigata* was the most common species in the Rockingham-Bay district. *P. tabuensis* and *palustris* were plentiful about Rockhampton and on the swamps in the neighbourhood of the mouth of the Burnett river; *P. fluminea* I met with but once, at Port Mackay.

250. CHENOPIS ATRATA.

Chenopis atrata, Gould, Handbk. B. Austr. ii. p. 346.

The Black Swan is found rarely in Queensland north of the Burnett river, which I think was the only place I met with it. I have been informed that it sometimes occurs during wet seasons on the Herbert river.

251. ANSERANAS MELANOLEUCA.

Anseranas melanoleuca, Gould, Handbk. B. Austr. ii. p. 352.

Plentiful throughout the swampy districts all over the south and eastern portions of Australia. I have examined specimens from South Australia, and met with it almost every day while encamped on the Herbert river. The young were brought in by the natives on several occasions during the months of March and April.

252. CHLAMYDOCHEN JUBATA.

Chlamydochen jubata, Gould, Handbk. B. Austr. ii. p. 354.

This fine species of Wood-Goose is not by any means so plentiful

in Queensland as in New South Wales. I met with them only on one or two occasions, at the mouth of the Burnett river, and inland about fifty miles from the coast, near the head-waters of the Herbert river.

253. NETTAPUS PULCHELLUS.

Nettapus pulchellus, Gould, Handbk. B. Austr. ii. p. 357.

This species is one of the rarest in our Australian collections, occasional stragglers only visiting the eastern portions of Queensland, whence I have only seen three skins. It is at times found at Cape York; and Inspector Johnstone, of Cardwell, informed me that he once met with a specimen in one of the numerous swamps of the Herbert district.

Mr. Wilcox, of the Clarence river, I believe once obtained it, in company with the common species, *N. albipennis*, from one of the swamps near Grafton.

254. NETTAPUS ALBIPENNIS.

Nettapus albipennis, Gould, Handbk. B. Austr. ii. p. 359.

This is one of the most common species in the neighbourhood of Rockhampton and on the Fitzroy river; it is also plentiful on the Burnet-river swamps.

255. TADORNA RAJAH.

Tadorna rajah, Gould, Handbk. B. Austr. ii. p. 360.

I found this fine Wood-Duck breeding in holes in the hollow limbs of trees during the months of December and January. It is a common species all over Queensland north of the Mary river. I have received specimens from Port Denison and Rockingham Bay, and also examined specimens from Port Moresby, in New Guinea. The Port-Moresby birds have a much narrower pectoral band than is found in the Australian examples I have seen.

256. ANAS SUPERCILIOSA.

Anas superciliosa, Gould, Handbk. B. Austr. ii. p. 363.

257. ANAS PUNCTATA.

Anas punctata, Gould, Handbk. B. Austr. ii. p. 365.

258. DENDROCYGNA GOULDI.

Dendrocygna gouldi, Gould, Handbk. B. Austr. ii. p. 374.
D. vagans? auct.

259. DENDROCYGNA EYTONI.

Dendrocygna eytoni, Gould, Handbk. B. Austr. ii. p. 375.

These four species I found plentiful in the swamps and rivers of North-eastern Queensland. The first three mentioned are the most plentiful and widely distributed.

D. gouldi I have seen even from southern parts of New S. Wales,

and some in the flesh said to have been obtained from the lakes near Ballarat, in South Australia. It is one of the most common ducks north of the Burnet river.

D. eytoni is abundant near Port Denison; and from Rockingham Bay I have also obtained specimens. An egg taken from the oviduct by Mr. Rainbird, of Port Denison, measures 1·95 inch by 1·5 in breadth; it is of a light creamy white, and slightly ovate, and appears to be comparatively a very small egg for a bird of this size to lay.

260. NYROCA AUSTRALIS.

Nyroca australis, Gould, Handbk. B. Austr. ii. p.377.

Met with once in the swamps of the Herbert-river district.

261. LARUS PACIFICUS.

Larus pacificus, Gould, Handbk. B. Austr. ii. p. 385.

I found this noble species rather plentiful on the mud-flats and margins of many of the rivers at low tides. They ascend the rivers in company with *Xema jamesoni* to a considerable distance. I noticed several pairs near the wharfs at Rockhampton.

262. XEMA JAMESONI.

Xema jamesonii, Gould, Handbk. B. Austr. ii. p. 387.

Common all along the coast from Melbourne to Cape York.

263. STERCORARIUS CATARRHACTES.

Stercorarius catarrhactes, Gould, Handbk. B. Austr. ii. p. 389.

264. SYLOCHELIDON CASPIA.

Sylochelidon caspia, Gould, Handbk. ii. B. Austr. p. 392.

265. ? THALASSEUS POLIOCERCUS.

? *Thalasseus poliocercus*, Gould, Handbk. B. Austr. ii. p. 396.

266. STERNA MELANORHYNCHA.

Sterna melanorhyncha, Gould, Handbk. B. Austr. ii. p. 398.

I obtained these Terns on one occasion in Rockingham Bay; they did not not appear to be rare in that neighbourhood.

267. STERNULA PLACENS.

Sternula placens, Gould, Ann. & Mag. Nat. Hist. 4 ser. vol. vii p. 192.

I first found this beautiful species December 1865, at the mouth of the Richmond river, when I took it for *S. nereis*. I have repeatedly found them at different times during the last six years from as far south as Illawarra to Rockingham Bay in North-eastern Queensland, where it appears to be one of the most common species of Tern.

268. HYDROCHELIDON FLUVIATILIS.

Hydrochelidon fluviatilis, Gould, Handbk. B. Austr. ii. p. 406.

This species I have obtained from the Richmond river and Rockingham Bay; it was also tolerably plentiful at the time of my visit in December 1870, at Rockhampton, on the Fitzroy river, and on the Mary river.

269. GELOCHELIDON MACROTARSA.

Gelochelidon macrotarsa, Gould, Handb. B. Austr. ii. p. 403.

I found this fine Tern on the Brisbane river in 1873–4, and also obtained a fine pair of adult specimens from the Clarence river. I met with it at Rockingham Bay, at the mouths of the Herbert river, and also at a considerable distance up the stream, about 20 miles from the mouth. It is still rare in Australian collections.

270. ANOUS STOLIDUS.

Anous stolidus, Gould, Handbk. B. Austr. ii. p. 413.

Common on all parts of the east coast.

271. DIOMEDEA MELANOPHRYS.

Diomedea melanophrys, Gould, Handbk. B. Austr. ii. p. 438.

Met with only on one occasion off the coast near Gladstone, Port Curtiss.

272. PELECANUS CONSPICILLATUS.

Pelecanus conspicillatus, Gould, Handbk. B. Austr. ii. p. 486.

I noticed this fine species breeding in great numbers on a flat-topped rocky island off the coast near Cleveland Bay. Numbers were soaring over the island, some close to the surface, others sitting quite motionless on the ground, the neck held upright, with the head and bill at right angles to it, giving the group quite a grotesque appearance.

273. PHALACROCORAX NOVÆ-HOLLANDIÆ.

Phalacrocorax novæ-hollandiæ, Gould, Handbk. B. Austr. ii. p. 488.

This fine species is common all along the eastern coast; it ascends the river to a considerable distance, and seems as much at home in fresh as in salt water.

274. PHALACROCORAX MELANOLEUCUS.

Phalacrocorax melanoleucus, Gould, Handbk. B. Austr. ii. p. 493.

275. PHALACROCORAX STICTOCEPHALUS.

Phalacrocorax stictocephalus, Gould, Handbk. B. Austr. ii. p. 495.

Both common species, frequenting the bays and inlets of the sea

and the mouths of the rivers, swamps, and lagoons, and even water-holes at a considerable distance inland. They nest in trees over-hanging the rivers or waterholes, making a rough nest of water-weeds and débris: lay 2 to 3 eggs.

I met with both species in a small lagoon some twenty miles inland in the Herbert-river district in March 1874.

A large white-breasted species was seen on several occasions in Rockingham Bay; but none were shot, and I was too far off to identify the bird; but it was probably *P. varius*.

276. PLOTUS NOVÆ-HOLLANDIÆ.

Plotus novæ-hollandiæ, Gould, Handbk. B. Austr. ii. p. 496.

This is a widely distributed species, found on all the rivers as far north as Cape York. I have also met with it at a great distance inland. That its range extends to New Guinea is proved by the fact that the Museum has lately received a specimen from the "Laloki river," near Port Moresby, about fifteen miles from the settlement. There are some slight differences in the style of coloration of the New-Guinea specimen, but scarcely sufficient for the foundation of a new species.

277. PHAËTON PHŒNICURUS.

Phaëton phœnicurus, Gould, Handbk. B. Austr. ii. p. 501.

Seen occasionally off Hinchinbrook Island.

278. SULA AUSTRALIS.

Sula australis, Gould, Handbk. B. Austr. ii. p. 504.

Rather plentiful in the Bay off Cardwell.

279. SULA FIBER.

Sula fiber, Gould, Handbk. B. Austr. ii, p. 507.

Occasionally seen in the bay, but more plentiful off a small reef to the south-east of Hinchinbrook Island, and near the mouth of the Herbert river.

280. PODICEPS, sp. inc.

This I take to be *P. gularis*. Only met with on one occasion, in a chain of lagoons near the Herbert river.

APPENDIX.

Shortly after my return from Queensland, Mr. Sub-Inspector Armit, who had taken great interest in my pursuits, forwarded me a small collection of birds from the neighbourhood of Georgetown, and also some very interesting notes on the avifauna of that district. From this collection I can add the following species which I had not observed myself:—

HALCYON PYRRHOPYGIA, Gould, Handbk. B. Austr. i. p. 130,

FALCO HYPOLEUCUS, Gould, Handb. B. Austr. i. p. 24,

MYZOMELA PECTORALIS, Gould, Handb. B. Austr. i. p. 557,

several specimens in various stages of plumage; and the following, which may claim to be added to this list:—

281. PARDALOTUS RUBRICATUS.

Pardalotus rubricatus, Gould, Handbk. B. Austr. i. p. 158.

This species builds a nest very similar to that of *P. melanocephalus* and *S. punctatus*, digging a tunnel in a soft bank, and making a loosely woven structure in a hollowed-out chamber at the end. The eggs are four in number, white, and about the same size as those of *P. melanocephalus*. In length 0·7 inch by 0·55 in breadth.

Hab. Ethridge river, Queensland.

282. PARDALOTUS UROPYGIALIS.

Pardalotus uropygialis, Gould, Handbk. B. Austr. i. p. 166.

Mr. Armit informs me that this bird breeds in the same manner as the foregoing, and that its habits and actions are the same.

Hab. Ethridge river, Queensland.

283. PACHYCEPHALA FALCATA.

Pachycephala falcata, Gould, Handbk. B. Austr. i. p. 213.

In these specimens the male has the chest of a dull light sandy brown.

284. PTENŒDUS RUFESCENS.

Ptenœdus rufescens, Gould, Handbk. B. Austr. i. p. 397.

285? MALURUS CRUENTATUS.

Malurus cruentatus, Gould, Handbk. B. Austr. i. p. 334.

286. POËPHILA MIRABILIS.

Poëphila mirabilis, Homb. et Jacq.; Gould, Handbk. B. Austr. i. p. 421.

One female sent confirms the fact of *P. gouldiæ* being the female of *P. mirabilis*. Mr. Armit found them breeding. The male bird had, he states, the face carmine red.

287. PTILOTIS SONORA.

Ptilotis sonora, Gould, Handbk. B. Austr. i. p. 504.

288. PTILOTIS UNICOLOR.

Ptilotis (*Stomiopera*) *unicolor*, Gould, Handbk. B. Austr. i. p. 523.

289. ENTOMOPHILA RUFIGULARIS.

Entomophila (*Conopophila*) *rufigularis*, Gould, Handbk. B. Austr. i. p. 533.

290. MELITHREPTES LÆTIOR.

Melithreptus lætior, Gould, Ann. & Mag. Nat. Hist. ser. 4, vol. xvi. p. 287.

291. CALOPSITTA NOVÆ-HOLLANDIÆ.

Calopsitta novæ-hollandiæ, Gould, Handbk. B. Austr. ii. p. 84.

292. PTILOSCLERA VERSICOLOR.

Ptilosclera versicolor, Vigors; Gould, Handbk. B. Austr. ii. p. 98.

Some fine specimens were obtained on Carron's Creek.

This brings my list of Birds of North-eastern Queensland &c. to a close. I might have added several more to it had I been enabled to remain longer in some of the inland districts; and I regret also that I did not shoot specimens of some of the species. These consequently I have not been able to determine with that degree of certainty I should like; for I find in one or two instances the birds I then took to be identical with our New-South-Wales species have turned out to be *new*. This is the case with *Oreocincla*, sp. No. 110, which I find to be *O. iodura* of Mr. Gould.

I also observed that the *Sittella leucocephala*, from the neighbourhood of Port Denison, has a *white* band through the wing instead of a reddish or "*rusty-red*" one, as described by Mr. Gould. In other respects it is almost exactly the same. I have only observed three specimens with this peculiarity, but am daily expecting a large series from Bowen, when I will make some further remarks, and give a fuller description of the bird; for the present I propose the name of *albata* for the Port-Denison specimens, distinguished by having a *white band through the wing*, commencing on the *first primary* and *extending to the 9th quill*.

SITTELLA ALBATA, sp. nov.

Head and neck, a small spot at the base of the primaries on the underside of the wing, a band through the wing as far as the 9th quill, the upper tail-coverts, and the tips of all the tail-feathers except the centre two, snow-white; under surface ashy white, with a broad dark-brown stripe down the centre of each feather; under tail-coverts of a darker brown, tipped and margined anteriorly with white; back and scapulars brown, darker in the centres of the feathers; wing- and tail-quills blackish brown, the former crossed with a white band as far as the ninth quill; bill at the base, the legs and feet, and skin round the eye yellow, remainder of the bill black. Length 3·7 inches, wing 3, tail 1·5, tarsi 1·7, bill 0·5, bill from gape 0·7.

Finally, I may as well correct an error which occurs in the name of sp. no. 57, Part I. of this paper (P. Z. S. 1875, p. 584): *Artamus cinereus* should be *Artamus albiventris*, Gould. And under sp. no. 125, *Stigmatops subocularis*, the latter part of my remarks refer to *Stigmatops ocularis*, the Sydney species.

5. On a new Species of *Sthenurus*, with Remarks on the Relation of the Genus to *Dorcopsis*, Müller[1]. By Professor Owen, C.B., F.R.S., F.Z.S., &c.

[Received April 4, 1877.]

(Plates XXXVII. & XXXVIII.)

The present species of extinct Kangaroo is founded on a fossil fragment of skull including the molar series of both sides of the upper jaw with the intervening bony palate (see Plate XXXVII.).

The reference to the genus *Sthenurus* in Prof. Garrod's excellent memoir on *Dorcopsis luctuosus*[2] encourages me to think the following notes may not be unacceptable to the Society, which has occasionally admitted illustrations of extinct animals into its publications.

The fossil was found in a "rocky alluvial deposit" in the shaft of a gold-lead in the county of Phillip, New South Wales, Australia, and was transmitted to me by the Rev. William Branthwaite Clarke, M.A., F.R.S., the veteran geologist of New South Wales. The fossil is in a massive petrified condition.

The genus *Sthenurus* is chiefly characterized by the configuration and fore-and-aft extent of the premolar (Plate XXXVIII. figs. 1, 5, 12, *p* 3), which exceeds that of the following molar (ib. figs. 5, 12, *d* 4) commonly to the extent of one half of the next molar, *m* 1. The premolar in the upper jaw has an outer (ib. figs. 3, 7, 14 *d*) and an inner (ib. ib. *e*) trenchant plate, the latter being lower in extent, almost basal in position; the plates are united together by two or more low transverse ridges. The crown of the tooth is thus partly trenchant, partly triturant.

The molars have the two transverse lobes (ib. figs. 4, 7, 8, 14, 15, *a* and *b*) of the macropodal type, well developed, with their summits trenchant and slightly curved prior to abrasion, with a "prebasal ridge" (ib. figs. 4, 8, 15, *f*) and a low and small "mid link" (ib. fig. 8, *r*), continued at almost a right angle forwards from the inner inflection of the fore lobe. The hind lobe of the last molar (*m* 3) is a little narrower than the fore lobe.

The upper incisors (ib. fig. 11) work on the same horizontal plane; and the crown of the third (*i* 3) exceeds that of the first (*i* 1) in fore-and-aft extent.

The smallest species of the extinct genus known at the date of my eighth paper on the "Fossil Mammals of Australia"[3] was the type one (*Sthenurus atlas*) in which the fore-and-aft extent of the crown of the upper premolar (ib. figs. 5, 6, 7, *p* 3) is 9 lines, that of the entire permanent series of upper molars being 2 inches 11 lines. A second species of *Sthenurus* (*S. brehus*) has the upper premolar (ib. figs. 12, 13, 14, *p* 3) 10 lines in fore-and-aft extent; that of the perma-

[1] Zoogd. v. den Indischen Archipel, pt. 4, pl. xxiii. (skull and dentition, figs. 7 and 8), plate xxiv. fig. 7 (*Hypsiprymnus brunii*; *Dorcopsis* in text) 1841.

[2] Proc. Zool. Soc. 1875, pp. 48 and 58.

[3] Phil. Trans. 1874, p. 245, pls. xxii. and xxiv.

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2



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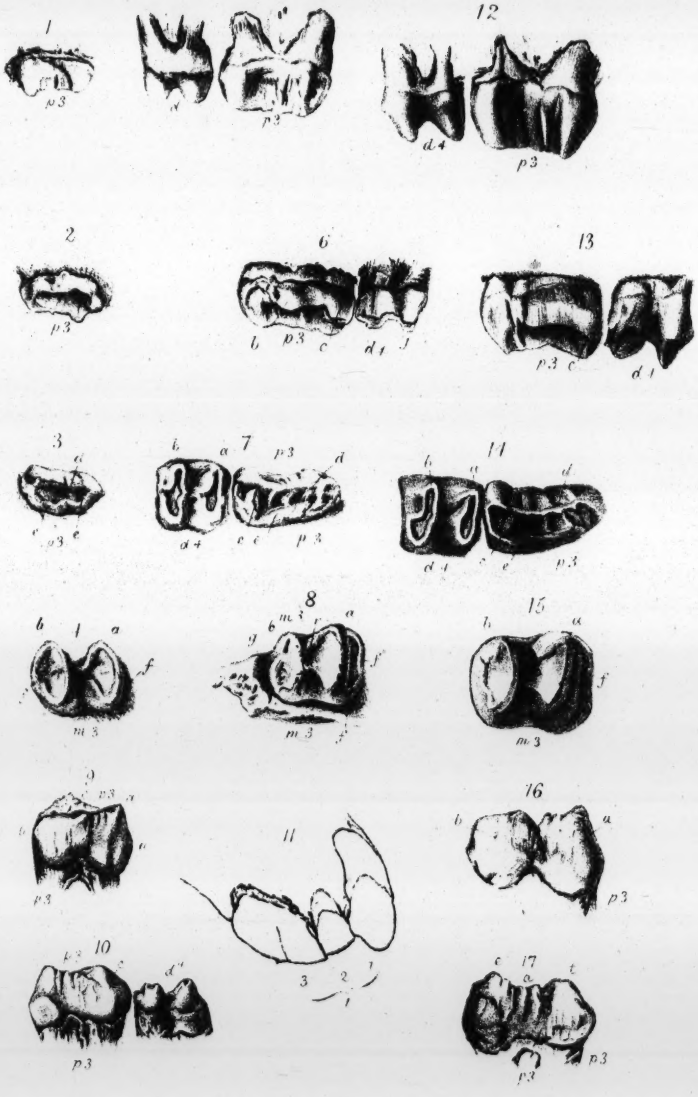


J. Smit. lith.

M. & N. Hanhart. imp.

STHENURUS MINOR.

1 MAY 28



J. Smit Mo.

M&N Hanhart imp.

4 STHENURUS MINOR. 5.11 STHENURUS ATLAS. 12.17 STHENRUS PRPHUS



nent series of upper molars is 3 inches 4 lines[1]. In *Osphranter rufus* this series is 2 inches 3 lines, reduced by loss of the premolar to 2 inches (as in Trans. Zool. Soc. vol. ix. pl. 74. figs. 1 and 3); and these dimensions are not exceeded in *Macropus major*.

The extinct Kangaroo, represented by the subjects of Plate XXXVII. somewhat exceeded the above largest known existing species. The fragment of skull is a little larger than the corresponding part of a full-grown *Macropus major*, with the last molar in place and use and the premolar shed; it consists of both maxillaries with their respective (right and left) molar series, the intervening bony palate, and a portion of the right orbit and zygoma with the descending masseteric process.

The dentition is in an instructive phase. The left series of grinders shows the premolar (ib. fig. 1), $p\,3$, in place, and the last molar, $m\,3$, protruding from the formative cell. The right series shows the deciduous predecessors ($d\,2$, $d\,3$) of $p\,3$ in place, and $m\,3$ less advanced than on the left side. Thus there are five functional grinders on the right side and four on the left side of the upper jaw. The formula of the left series is $p\,3$, $d\,4$, $m\,1$, $m\,2$ ($m\,3$ not fully emerged); the formula of the right series is $d\,2$, $d\,3$, $d\,4$, $m\,1$, $m\,2$ ($m\,3$ less advanced). Accordingly the outer parietes of the right maxillary were removed above $d\,2$ and $d\,3$ with the usual result, the crown of $p\,3$ and beginning of its roots becoming exposed in the formative cell (Plate XXXVII. fig. 2, $p\,3$).

The fore-and-aft extent of the left permanent series of upper molars is 2 inches 10 lines, that of the four bilophodont molars (corresponding with those shown in the skull of *Osphranter rufus*, Trans. Zool. Soc. *tom. cit.*) is 2 inches 3 lines; but the inferiority of size of the present species of *Sthenurus* to the two previously known species suggested the "nomen triviale." *Sth. minor*, however, surpasses in size any known existing Kangaroo, but is the smallest known of its genus.

In the comparisons required for taxonomic conclusions as to these large extinct Kangaroos, I found, in 1873, the nearest approach to the character of the premolar of *Sthenurus* in some small Kangaroos of the genus *Halmaturus*, and I figured the dentition of *H. ualabatus*[2] (Phil. Trans. *tom. cit.* plate xxiv. figs. 1, 2, 3, 10, 11, 12) as showing the nearest resemblance to that of *S. atlas* (ib. ib. figs. 4, 5, 6, 7, 8). But the premolar of the *Halmaturus*, with the same general type, had less relative antero-posterior extent, and had not the smaller deep-seated transverse ridges; the bony palate also, as in other Wallabies, presented a pair of large vacuities. Subsequently[3] I was enabled to show a more marked generic distinction in the form, sculpturing, and proportions of the upper and outer (third) incisor.

In 1874, M. D'Albertis described and figured a small existing kind of Kangaroo under the name of *Halmaturus luctuosus*[4], obtained

[1] Phil. Trans. 1874, p. 272, pl. xxvii. figs. 5–9.

[2] Lesson, not Gray; the latter is probably a variety of *Halmaturus ruficollis*, Desm.

[3] Phil. Trans. 1876, p. 211, pl. xxv. figs. 2, 3, pl. xxviii. figs. 1, 3.

[4] Proceedings of the Zoological Society, 1874, p. 110, et p. 247, pl. xlii.

in the south-east of New Guinea, with a premolar more trenchant than in *Sthenurus*, and with the proportions of the tooth differing in the opposite extreme of fore-and-aft extent, and in greater degree than in *Halmaturus*, from those of the premolar of *Sthenurus*. This rare Kangaroo was deposited in the Zoological Gardens, and on its death, in November 1874, was anatomized by the accomplished prosector, A. H. Garrod, B.A., by whom the skull and teeth are well described and figured[1]. The state of dentition on both sides of the upper jaw is that shown on the left side of the fossil above described; the premolar is in place, and the last molar partially extricated from its formative alveolus. Prof. Garrod refers the species to the same genus as the *Dorcopsis muelleri* of Schlegel.

The premolar of *Dorcopsis luctuosus* shows an antero-posterior extent of crown relatively greater than in *Sthenurus*; it develops a single trenchant ridge, forming the main part of the body and summit of the crown, being supplemented on the outer and inner sides by a subtubercular basal ridge or cingulum. The antero-posterior extent of the premolar in the larger kinds of *Sthenurus* does not exceed that of the contiguous molar, *d* 4, and one half of the next molar, *m* 1; in *Sthenurus minor* (Plate XXXVII. fig. 3, *p* 3) its extent is relatively less; in *Dorcopsis* it exceeds that of the two succeeding molars and a little over (P. Z. S. 1875, plate vii. figs. 2 and 3). In all the species of *Sthenurus* the outer ridge of the premolar rises directly from the base of the crown (Plate XXXVIII. figs. 1, 5, 12, *p* 3), and inclines so little inwards that its summit as well as base is on the outer side of the working surface of the tooth (ib. figs. 3, 7, 14, *p* 3, *d*); in *Dorcopsis* there is a series of small prominences, a tuberculate cingulum, on the outer side of the base of the outer ridge, and the trenchant margin of this ridge (through its greater inclination inwards) traverses the middle of the working surface of the tooth[2]. The tubercular character of the inner ridge in *Dorcopsis* seems a repetition, on that side, of the tubercular cingulum on the outer side of the base of the crown. In *Sthenurus* the transverse thickness of the premolar decreases as the crown extends forward; in *Dorcopsis* the transverse thickness is uniform, or is maintained to very near both ends of the crown (comp. *tom. cit.* plate vii. fig. 2 with Plate XXXVIII. figs. 3, 7, 14, *p* 3).

The broadest (hindmost) part of the premolar in *Sthenurus* (Plate XXXVIII. figs. 7, 14, *p* 3, *c*) is not quite equal to that of the fore lobe of the contiguous molar (ib. *d* 4), and is markedly inferior to that of the next (second) molar (Plate XXXVII. fig. 1, *m* 1); in *Dorcopsis* the breadth of the base of the premolar equals that of the next and following molars (*d* 4).

The post-internal tubercle of the premolar of *Sthenurus* is united by a transverse ridge with the hind summit (Plate XXXVIII. figs. 6, 7, 13, 14, *c*) of the outer longitudinal lobe or plate (*d*). The corresponding tubercle in *Dorcopsis* is not so united with the homo-

[1] P. Z. S. 1875, p. 48, pls. vii., viii., ix.

[2] Hence Prof. Garrod describes the crown of the tooth as "prismatic in shape," *loc. cit.* p. 54.

logous, but here median, longitudinal ridge. In sum, the upper and long premolar in *Dorcopsis*, like that of the short premolar of *Dendrolagus*, is generically distinct in its modifications from that of the premolar in the three known species of *Sthenurus*.

In the upper molars of *Sthenurus* the prebasal ridge is relatively larger than in *Dorcopsis* and *Dendrolagus*, the mid link is better developed; there is an increase of breadth from the first (*d* 4) to the third (*m* 2) molar in *Sthenurus* not shown in *Dorcopsis* (comp. figs. *d* 4, *m* 3 in Plate XXXVII. with fig. 2, pl. vii. P. Z. S. 1875).

The generic type of the lower premolar is still more marked in *Dorcopsis* (ib. plate vii. fig. 3) and *Dendrolagus* as compared with its homologue in *Sthenurus* (Plate XXXVIII. figs. 9, 10, 16, 17); this is manifested in the latter genus by the bilobed character of the outer surface, conspicuously shown in the unworn, unexcluded crown of the tooth in the type species of the genus (*Sthenurus atlas*)[1].

In *Dorcopsis* the outer surface, like the inner one, of the lower premolar retains the simple vertically grooved surface as in the Potoroo type (*Hypsiprymnus*). The tendency to that modification of Macropodal structure is further shown by the retention of the canines, though minute, in the upper jaw, by the predominance in size of the foremost upper incisor, *i* 1, and the production of its cutting surface beyond or below the horizontal line of wear of the two following incisors (*i* 2, *i* 3). The canines are relatively larger in *Dendrolagus*, as in the Hypsiprymninæ.

I have not found an upper canine in a *Sthenurus* of any age. In the fossil of the young *Sthenurus atlas* (the subject of plate xxv. fig. 2, Phil. Trans. 1876), with the dentition less advanced than in the present evidence of *Sthenurus minor*, the maxillo-premaxillary suture shows no trace of such tooth or of any socket of a shed rudiment; yet the foremost incisor was not fully in place, and the crown of the third incisor required for exposure the removal of the premaxillary alveolar wall. The character of the crown of *i* 3, so detected, enabled me to determine the detached homologous teeth of old individuals of *Sthenurus atlas*. In all the pattern is distinct from that of *i* 3 in either *Dorcopsis* or *Dendrolagus*. Subsequent acquisitions of premaxillaries and their teeth of the larger species, *Sthenurus brehus*, showed the same generic character (plate xxviii. figs. 1, 3, *i* 1, *i* 2, *i* 3, Phil. Trans. 1876). The outer or labial surface of the crown of *i* 3 is equally bisected by a subvertical linear groove or enamel-fold; the fore-and-aft breadth of the unworn crown exceeds that which appears in the side view of *i* 1 (Plate XXXVIII. fig. 11) in *Sthenurus atlas*, and equals the total breadth of that tooth. The three incisors on each side work on the same horizontal level.

In all these characters *Sthenurus* deviates from the Halmaturine, Dorcopsine, and Hypsiprymnine types, and approaches that of the great Kangaroos represented by *Macropus* proper, *Osphranter*, and *Boriogale* (Phil. Trans. 1874, plate xx. figs. 17, 18, 19).

[1] Mitchell's 'Three Expeditions into the Interior of Eastern Australia,' 8vo, 1838, plate xxix. fig. 1; Phil. Trans. 1874, pl. xxii. figs. 4, 5, 6, *p* 3, pl. xxiv. fig. 7, *p* 3.

What evidence, it may be asked, does the skeleton afford of the affinities of the huge extinct Kangaroos of the genus *Sthenurus*? I am able only to adduce those yielded by the skull. The time may arrive when, in some Australian cavern, a greater proportion of the enduring framework may be recovered in connexion with the skull and dentition of one and the same individual. Fortunately the cranial characters at present known are instructive ones, are well shown in the portion of skull of the smaller species under description, and the more welcome as repeating those previously given by a corresponding portion of a skull of *Sthenurus brehus* (Phil. Trans. 1874, plate xxviii. fig. 6). The first of these characters is the integrity of the bony palate. In *Dorcopsis* (P. Z. S. 1875, plate vii. fig. 2), as in the Hypsiprymninæ, and as in most of the smaller Kangaroos which have been grouped under the less-definite genera *Halmaturus*, *Petrogale*, *Lagorchestes*, the bony palate shows two or more large vacuities[1]. In *Dendrolagus* the palate is entire, as in *Macropus* and *Sthenurus*. The masseteric process is short in *Dorcopsis*, as in the Hypsiprymnines; it is long in *Sthenurus*, as in *Macropus*.

The relative position of the masseteric process to particular molar teeth, outside which it descends, varies at different phases of the acquisition of the molars. In *Sthenurus* it is always opposite the interspace between the penultimate and last molar "in place." Thus in the immature specimen of *Sthenurus minor*, in which m 3 is not extricated, the process is opposite the interspace between m 2 and m 1; in the mature *Sthenurus brehus*[2] it is opposite the interspace between m 2 and m 3. In the specimen with m 3 in place, but less mature in age[3], the process is opposite a larger proportion of m 2, though partly hiding the interspace between it and m 3. The relative position of the masseteric process, described as a differential character between *Dorcopsis luctuosa* and *D. muelleri*[4], may depend upon the incomplete development of m 3 in the subject of Prof. Garrod's plate vii. fig. 3 (*loc. cit.*).

The forward movement of the molar series is effected by that of their sockets; but the superincumbent pier of the zygoma does not participate in the molecular additions and subtractions to which that movement of the dental cases is due. Such movement is most striking, and was first impressed upon my mind as the true dynamic in the change of place of growing teeth, in the jaws of the Elephant,

[1] The characters of the bony palate are defined and exemplified in the plates of the papers "On the Osteology of the Marsupialia," in the Trans. Zool. Soc. In vol. ii. pl. lxxi. fig. 5, the vacuities are shown in *Halmaturus bennettii* (a near ally, if not a local variety of *Halm. ruficollis*, Gould); in vol. ix. pl. lxxiv. the entire condition of the palate is shown in *Macropus* (*Osphranter*) *rufus*.

[2] 'Researches on the Extinct Mammals of Australia,' 4to, 1877, vol. ii. pl. lxxviii. fig. 6.

[3] *Ibid.* pl. cviii. figs. 1, 21.

[4] "In *D. luctuosa* the apex of the 'angular process which is developed downwards from the inferior margin of the maxillary portion of the zygoma' is opposite the anterior cusp of the third molar tooth, whilst in *D. muelleri* it corresponds to the posterior cusp of the second molar" (p. 52). In the specimen, as in the 'plate vii.,' the tip of the masseteric process is opposite the interspace between the two lobes of m 1.

in which, as is well known, the true molars (a backward continuation of the deciduous series) are always on the move in a curve from behind forward, and are shed in front as they are developed behind. The sockets or cases of the huge complex grinders are more distinct, as such, from the surrounding maxillary or mandibular bones, than in other mammals[1]. This dynamic has been well exemplified as efficient in the vertical movements of permanent incisors and canines of the human subject by the present Lecturer on Dental Surgery at St. Bartholomew's Hospital, Mr. Alfred Coleman[2].

Such are the grounds which oppose my acceptance of the conclusions of a fellow labourer whose opinion I value. Prof. Garrod expresses them as follows:—

"An inspection of the plates in Prof. Owen's paper on these new genera (Phil. Trans. 1875, p. 245) makes it evident that they are scarcely distinguishable from *Dendrolagus*, and must be included in the *Dorcopsis* section of the family."

The genera alluded to are those defined in the Philosophical Transactions, 1874, p. 245 *et seq.*, under the names *Protemnodon* and *Sthenurus*.

Professor Garrod assigns no grounds for their necessary inclusion in the section cited; if he should be disposed to define them they will receive my due attention.

In such inquiries and comparisons I would venture to express the advantage I have derived from definite conclusions as to the homologies of the teeth, resulting in a power of defining them individually by symbols; for whether such symbols be accepted or not, they briefly but unmistakeably show the writer's meaning. In the quotation (P. Z. S. 1875, p. 52) relative to the position of the masseteric process, one could not be sure which molar Prof. Garrod meant without referring to the plate vii. And again, in the description of his plate ix. (P. Z. S. 1875), the author writes:—"the third and fourth rows the upper and lower third left molar" (p. 59). Counting the molars from before backwards the third would be the penultimate one. Comparing the figures with the original specimen now in the British Museum I find fig. 3 most resembling, in the relative size of the hinder lobe, the last of the molar series, viz. the fourth, counting backward; but this is the homologue, in my view, of the third true molar in the typical diphyodont dentition, consequently bearing the symbol *m* 3 in Plate XXXVIII. figs. 8, 15, of the present paper.

But if the molar tooth, fig. 3 in Prof. Garrod's plate, be the homologue of figs. 8 and 15 in mine, it yields a comparison bearing on the question at issue. In many Wallabies, as in the Potoroos (Hypsiprymninæ) the last molar, *m* 3, differs from that in *Macropus* proper and in *Sthenurus* by its smaller relative size, especially of its hinder lobe; and I see in this character of *Dorcopsis*, associated as

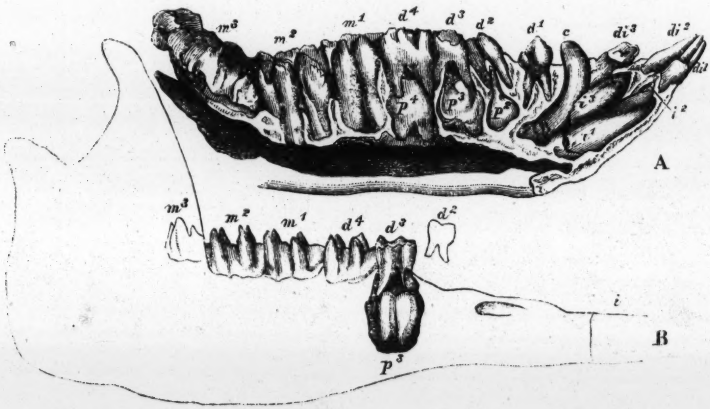
[1] "The bony plate (ib. fig. 2 *a*) forming the sockets of the growing teeth is more than usually distinct from the body of the maxillary, and participates in this revolving course, advancing forwards with the teeth." ('Odontography,' 1840-45, p. 639.)

[2] St. Bartholomew's-Hospital Reports, vol. xii. p. 92.

it is with the characters of the long trenchant premolars, the retained canines, the produced anterior incisors, and the palatal vacuities, an addition to those evidences of the departure of the genus from *Macropus* proper and *Sthenurus*, and of its approximation to *Hypsiprymnus*.

It may be that the grounds of my homologies of the teeth of Macropodidæ are not deemed conclusive. They are as follows, and I am open to any objections which may have barred Prof. Garrod's acceptance of them.

In the subjoined cut, A represents the dental series, deciduous and permanent, exposed in the right mandibular ramus of a young



Pig (*Sus scrofa*, L.); B represents the same in a young Kangaroo (*Macropus major*, Shaw).

In place of the incisors *di* 1, *di* 2, *di* 3, and of the canines, *c*, in the Pig (A), we have the single incisor, *i*, in the Kangaroo (B), which may be the homologue of *i* 1 in the Pig. Of the tooth *d* 1 in the Pig there is no homologue in the Kangaroo. The small foremost molar, *d* 2, in the Kangaroo, I view as the homologue of *d* 2 in the Pig; but in the Pig there is a vertical successor, *p* 2, which is not developed in the Kangaroo. The tooth *d* 3 in the Kangaroo is the homologue of *d* 3 in the Pig: in both it has a vertical successor—a true 'premolar,' *p* 3, which displaces it usually, in *Macropus major*, a short time after the fall of *d* 2; and this premolar rises into place, like *p* 3 in the Pig, without displacing the tooth *d* 4. Beneath *d* 4, in the Kangaroo, there is no vertical successor—no *p* 4 as in the Pig; and in this respect *d* 4 in the Kangaroo resembles *d* 2. These homologies being determined, or accepted, those of *m* 1, *m* 2, *m* 3, with the molars similarly symbolized in the Pig, follow as a matter of

course. The condition of $d4$ in the Kangaroo adds to the characters which have led odontologists to regard the three "true molars" of the diphyodont mammals, as being essentially a backward continuation of the first or deciduous series of teeth. With respect to $d2$, in *Macropus*, F. Cuvier remarks[1]:—"Dans le jeune âge, la première mâchelière est mince et analogue aux fausses molaires des genres précédens" (*Halmaturus, Hypsiprymnus*). "A mesure que les dents postérieures se développent, les antérieures qui sont usées et qui sont poussées en avant par les premières, s'oblitèrent et tombent de manière qu'elles finissent par se réduire à trois. Ainsi les premières ne sont pas, comme chez les halmatures, remplacées par des dents qui se développent sous elles, mais par les dents qui se sont développées derrière elles."

Now, if this statement of the distinguished odontologist (to whom we are indebted for the first work containing figures and formulæ of the teeth of the class Mammalia as then known) had been founded on fact, the distinction of *Sthenurus* from *Macropus* and its concomitant resemblance to *Dorcopsis* would have been as great as Prof. Garrod seems to have concluded. The mistake may have arisen from F. Cuvier having limited his quest to the part of the jaw immediately beneath the slender 'première mâchelière' ($d2$, B, in fig. 1). But had he carried the investigation further back he would certainly have come upon the vertical successor, $p3$, of $d3$, which he so well describes as characterizing his (not Illiger's) genus *Halmaturus*[2]. This procedure I practised in comparing, for description in the 'Appendix' to Mitchell's 'Three Expeditions' &c., the fossil remains from Australia, which that early and distinguished explorer of the continent brought to England and submitted to me in 1836: and thus I became aware of F. Cuvier's mistaken view of the generic character of *Macropus*, and was led to the discovery of the immaturity of the individual Macropodidæ of which portions of the fossil mandible and teeth seemed to represent full-grown Kangaroos of larger size than the largest known living specimen, called on that account *Macropus major*.

Later investigations of the fossil marsupials of Australia have led to the interesting result, that the developmental condition which F. Cuvier believed to differentiate the larger Kangaroos of the genus *Macropus* from the smaller kinds referred to *Halmaturus* and *Hypsiprymnus* does actually differentiate the huge extinct herbivorous marsupials of the genera *Nototherium* and *Diprotodon* from the Macropodidæ, which we now know to have been represented by species much exceeding in size the existing Kangaroos. Moreover, the large extinct Kangaroos, even in the partial degree in which we have already come to know them, manifest much better grounds for generic or subgeneric distribution than do any of the existing forms. And such extinct genera, represented as they are by species

[1] 'Des Dents des Mammifères,' 8vo, 1825, p. 138.

[2] *Op. cit.* p. 136. Mr. Waterhouse has given good illustrations of the deciduous and permanent premolars of *Hypsiprymnus*, in plate x. figs. 2, 4, of his 'Natural History of the Mammalia,' 8vo, 1845, p. 194.

larger than the existing kinds, manifest in a highly interesting and suggestive way an approximation to the Notothere and Diprotodons.

In *Nototherium*, although the premolar (by position) is characterized by an outer and an inner plate, antero-posteriorly disposed[1]; yet the transverse breadth of the tooth is proportionally so much greater than the fore-and-aft length, and the connecting ridges of the two plates, through the folding of the inner one, are so large, that the hind part of the premolar already assumes the character of a lobe of the transversely ridged dilophodont molars. In *Diprotodon* the dilophodont character is better shown[2], and the premolar (by position) is the first of the series of such molars, differing only in its inferiority of size. The qualification "by position" means that the tooth is not a veritable premolar, it never displaced vertically a deciduous predecessor, either in *Nototherium* or *Diprotodon*, but is the homologue of $d\,3$ in the Pig and Kangaroo.

Macropus, *Sthenurus*, *Procoptodon* exemplify stages of transition to the exclusively vegetarian character of the molar series exemplified by *Diprotodon*. The genera *Halmaturus*, *Dorcopsis*, *Dendrolagus*, *Hypsiprymnus* exemplify as many stages in the modification of the teeth for a mixed diet, which, in the Diprotodont series of Marsupialia, culminated carnivorously in *Thylacoleo*. Here the upper anterior incisors, $i\,1$, acquired their largest proportional size with the change of the trenchant for the piercing or laniary type. The single lower pair of incisors underwent the same modifications. The conversion of the premolar, in size and shape, to a carnassial tooth, and the reduction of the molars in number and size to the tubercular condition of the feline molar, are exemplified, in *Thylacoleo*, with corresponding figures of the jaws and teeth of our Cave-Lion and Cave-Hyæna, in plate vi. of my 'Researches on the Fossil Mammals of Australia.' In this work a preliminary chapter is devoted to the extinct Marsupials of England, in which it is shown that, at the oolitic period, our Marsupials had also diverged, by modifications of the fundamental type, into species exemplifying the 'polyprotodont'[3] and the 'diprotodont'[4] suborders — and that, in the formal or adaptive characters of the teeth, species diverged from the common carnivorous or insectivorous types exemplified in *Stylodon*[5] and *Thylacotherium*[6], to the vegetarian type in *Bolodon*[7] and *Stereognathus*[8] in one direction, and to the carnivorous type exemplified by *Triconodon* and *Plagiaulax*, in the opposite route.

EXPLANATION OF THE PLATES.

Plate XXXVII.

Sthenurus minor, Ow.

Fig. 1. Palatal surface of skull with right and left molar series.

2. Outer side view of alveolar part of the right maxillary, with the molar series *in situ*, and the undeveloped premolar exposed in its formative cell.

[1] 'Researches,' &c. vol. ii. pl. lxxviii. figs. 11–16.
[2] *Ibid.* pl. cxxiv. *d* 3.
[3] *Ibid.* pl. ii. fig. 17.
[4] *Ibid.* pl. iv. fig. 16.
[5] *Ibid.* pl. ii. fig. 14.
[6] *Ibid.* pl. i. fig. 23.
[7] *Ibid.* pl. iii. fig. 5.
[8] *Ibid.* pl. iv figs. 9–15.


1


2


3


3a


4


5


3b


6


8


7

G.B.Sowerby lith. M.& N. Hanhart imp.

NEW SPECIES OF HELICIDÆ, FROM S^TH AMERICA

Fig. 3. Outer side view of alveolar part of the left maxillary, with the molar series after the acquisition of the premolar *in situ*.

PLATE XXXVIII.

Sthenurus minor, Ow.

Fig. 1. Right upper premolar, outer side of crown.
2. The same tooth, the inner side of crown.
3. The same tooth, working surface of crown.
4. Right upper *m* 3, working surface of crown.

Sthenurus atlas, Ow.

5. Right upper premolar and contiguous molar, outer side of crown.
6. The same teeth, inner side of crown.
7. The same teeth, working surface of crown.
8. Right upper, *m* 3, working surface of crown.
9. Right lower premolar, outer surface of crown.
10. The same tooth with *d* 4, inner surface of crown.
11. Right upper incisors, outer side view.

Sthenurus brehus, Ow.

12. Right upper premolar and contiguous molar, outer side of crown.
13. The same teeth, inner side of crown.
14. The same teeth, working surface of crown.
15. The right upper *m* 3, working surface of crown.
16. The right lower premolar, outer side of crown.
17. The same tooth, inner side of crown.

All the figures in both Plates are of the natural size.

6. Description of new Species of South-American Helicidæ in the British Museum. By EDGAR A. SMITH, F.Z.S.

[Received April 10, 1877.]

(Plate XXXIX.)

HELIX (ISOMERIA) GEALEI. (Plate XXXIX. figs. 9 *a*, 9 *b*.)

Testa obtecte perforata, depresse conica, ad peripheriam acute carinata, oblique striata et granulata, supra unfr. ultimum malleata, castanea, versus apicem pallidior; spira depresse conica, apice obtuso, marginibusque vix convexiusculis; anfractus 5 parum convexi, lente accrescentes, sutura profundiuscula sejuncti, ultimus aliquanto pone labrum contractus, ad aperturam subito deflexus, constrictus, subtus ad labrum quasi distortus, circa medium acute carinatus, versus aperturam carina plus minusve evanescente; apertura subhorizontalis, intus pallide carnea; peristoma incrassatum undique æneo-viridi iridescens margine dextro sinuato reflexo dentem prominentem fuscum gerente, columellari lato reflexo umbilicum tegente, medio intra aperturam dente pallido minore munito, superne callo tenui prismatico labro juncto.

Diam. max. 37 mill., min. 30; alt. 17.

Hab. Malacatos, South Ecuador.

I feel much pleasure in associating with this remarkable species

the name of Mr. R. F. Geale, through whose agency it was obtained by the Museum.

Its most striking peculiarity is the beautifully iridescent lip, the predominating colours of which are green and brass. It is thickened and reflexed on all its margins. On the right-hand edge there is a prominent tooth, and above this a distinct deepish sinus. The tooth on the columellar border is smaller than the other, and situated further within the mouth. The malleation of the body-whorl is most conspicuous towards the mouth and in this region the minute granulation is less apparent than on the upper whorls.

Bulimus (Eurytus) roseolabrum. (Plate XXXIX. fig. 8.)

Testa angustissime rimata, ovata, superne acuminata, ubique minute granoso-striata, ochracea, maculis aspersis strigisque obliquis irregulariter ornata; anfractus $4\frac{1}{2}$ *planiusculi, rapide accrescentes, ultimus magnus, antice oblique descendens; sutura crenulata; apertura ovalis, superne acuminata, intus albido-ochracea, longitudine testæ totius* $\frac{2}{3}$ *paulo brevior; columella oblique arcuata, usque ad apicem conspicua; peristoma roseum undique breviter expansum et reflexum, marginibus callo tenui junctis.*

Long. 42 mill., diam. 18; apertura 26 mill. longa, 14 lata.

Hab. Malacatos, South Ecuador.

B. piperitus of Sowerby is the nearest ally of this species. From that form the present one differs in being smaller and consisting of a whorl less. The granulous sculpture is also different, and does not display that transverse direction which is noticeable in *B. piperitus*. The brown spotting is far less abundant; the general tint is yellower; and the peristome is rose-coloured and everywhere expanded and reflexed, which is not the case with Sowerby's species, in which it is usually white, and scarcely shows any expansion or reflexion; however, I have seen some examples of the Peruvian *B. piperitus* with a pink lip.

Bulimus (Drymæus) ochrocheilus. (Plate XXXIX. fig. 1.)

Testa ovato-fusiformis, anguste rimata, subtenuis, oblique irregulariter striata et malleata, sordide albida, seriebus (in anfr. superioribus 2, in ultimo 3) macularum fuscarum irregularium ornata; spira conica, marginibus leviter convexis; anfractus 7, lente accrescentes, convexiusculi, sutura vix oblique disjuncti, ultimus basi attenuatus; apertura oblonga, anguste elliptica, longitudinis totius testæ $\frac{1}{2}$ *æquans, subobliqua; perist. latiuscule expansum, flavidum, margine columellari reflexo, labro callo tenui flavescente juncto.*

Long. 37 mill., diam. 13. Apertura 20 mill. longa, $5\frac{1}{3}$ lata.

Hab. Malacatos, South Ecuador.

This species is closely allied to *B. yungasensis* of D'Orbigny, and differs from it chiefly with regard to the aperture, which is much longer, narrower, and differently coloured. Owing to the narrowness of the aperture, the last whorl is also much attenuated, con-

siderably more so than in D'Orbigny's species, which was obtained in Bolivia more than a thousand miles south of where the present form was collected.

The transverse brown spotting appears rather like interrupted bands than series of spots. These are connected by opaque white lines; and the uppermost series is the narrowest.

The lines of growth are rather coarse towards the labrum, which shows the yellow colour of the interior on the outside.

BULIMUS (DRYMÆUS) ÆQUATORIANUS. (Plate XXXIX. fig. 7.)

Testa umbilicata, ovato-acuminata, tenuis, minutissime spiraliter striata, incrementique lineis sculpta, lutescenti-albida, strigis nigro-fuscis latiusculis subfulguratis longitudinaliter strigata; spira conica, apice acutiuscula; anfr. 6 *parum convexiusculi, ultimus magnus, aliquanto inflatus, breviter ascendens; apertura ovalis, intus pallide lutescens, strigis pellucentibus, longitudinis totius* ½ *paulo superans; peristoma tenue, late expansum, extrinsecus et intus rosaceum, margine columellari late reflexo.*

Long. 26½ mill., diam. 11; apertura extrinsecus 14½ longa, 9½ lata.

Hab. Ecuador.

The species here described has been confounded with *B. fucatus* of Reeve, and was so labelled in the Cumingian collection. The type of that species, with the majority of all the others described in the late Mr. Lombe Taylor's collection having been most liberally presented to the British Museum by Mrs. L. Taylor, has enabled me to compare the two forms; and certain differences are observable which appear sufficiently constant to distinguish them.

In the first place, Reeve's species is from New Granada, and the present one from Ecuador. It is also larger than the former, has the body-whorl more inflated, the aperture is longer than half the entire length of the shell, whereas it is less in *fucatus*; the peristome is more inflated, and the coloration is different.

BULIMUS (DRYMÆUS) ALBOLABIATUS. (Plate XXXIX. fig. 4.)

Testa ovato-fusiformis, anguste (fere obtecte) perforata, tenuis, transversim obsolete striata, incrementique lineis obliquis sculpta, fusco-albida, strigis latis obliquis nigrescentibus vel purpureo-nigris fulguratis et fasciis interruptis ejusdem coloris (in anfr. superioribus 2, *in ultimo* 3) *ornata; spira elongata, conica, lateribus leviter convexis; anfract.* 6½, *convexiusculi, infra suturam leviter constricti, ultimus circa basim extraque labrum linea rufescente ornatus; apertura inverse auriformis, subverticalis, intus lilacea, strigis fasciisque pellucentibus, longit. totius* ½ *paulo minor; peristoma tenue, extrinsecus et intus album, sublate expansum, margine columellari reflexo, intus tortuoso.*

Hab. Malacatos, South Ecuador.

The nearest ally of this handsome species appears to be *B. fusoides* of D'Orbigny, which, however, is a much more elongated species, without transverse interrupted bands, at all events in the typical form, and with a rosy lip to the aperture.

The ground-colour of this species is a very pale fawn; and the stripes and interrupted bands are almost black, generally edged with brown or olive-brown.

Bulimus (Drymæus) orthostoma. (Plate XXXIX. fig. 5.)

Testa elongata, ovato-fusiformis, leviter rimata, tenuis, spiraliter tenuissime striata, incrementique lineis sculpta, albida vel fusco-albida, lineis longitudinalibus parum obliquis undulatis purpureo-fuscis et fasciis transversis interruptis (in anfr. superioribus 2, ultimo 3) saturatioribus picta; spira elongata, convexiusculo-conica, apice obtusiusculo; anfractus 6½, convexiusculi, ultimus elongatus, ad perist. brevissime pone labrum ascendens; apertura fere recta, elongata, inverse auriformis, longit. totius ½ paulo minor, intus lilacea, strigis pellucentibus; columella supra contorta, inferne arcuata; perist. tenue, mediocriter expansum, album, margine columellari extra subrecto.

Long. 37 mill., diam. 11½; apertura 18 longa, intus 6½ lata.

Hab. Ecuador?

The description of this species is very similar to that of *B. albolabiatus*; yet the two species when viewed side by side have a very different general aspect. The present species differs in having the aperture rather longer; and the whorls are not constricted just beneath the suture. The markings are not so bold or so deep in colour; the upper interrupted band is situated nearer the middle of the whorls; and in the last whorl, which has not the reddish line which winds round the base and along the exterior of the lip of *B. albolabiatus*, the markings cease at a short distance (about 4–5 millims.) from the labrum, which is pure white within and creamy on the outside like the rest of the shell; in the other species it is pure white on both sides.

Bulimus (Liostracus) subpellucidus. (Plate XXXIX. fig. 2.)

Testa fragilis, subpellucida, anguste perforata, elongato-conica, nitida, cornea, transversim obsolete striata, incrementique lineis obliquis sculpta; anfractus 7, convexiusculi, sutura minute crenulata sejuncti; apertura parum obliqua, ovata, longitudinis totius ⅜ æquans; columella superne rectiuscula, vix arcuata; peristoma tenue, undique mediocriter expansum, intus et extra flavescens, margine albido, marg. columellari dilatato.

Long. 23 mill., diam. 9; apertura 10 longa, intus 4½ lata.

Hab. Ecuador.

This simple species is chiefly characterized by its thin texture, horny colour, and the yellowish tint of the peristome, the extreme edge of which is whitish.

Bulimus (Liostracus) flavidulus. (Plate XXXIX. fig. 3.)

Testa profunde rimata vel perforata, ovato-pyramidalis, tenuis, semipellucida, nitida, minutissime spiraliter confertim striata, flavescens, seriebus (in anfract. superioribus 3, in ultimo 5) macularum subquadratarum fuscarum ornata; spira elongata,

conica, marginibus leviter convexiusculis, apice flavescente concolori; anfr. 7, convexiusculi, lente accrescentes, sutura anguste pallida sejuncti; apertura vix obliqua, ovalis, longitudinis totius testæ ¾ paulo superans; peristoma tenue, margine dextro brevissime (vix) expanso, columellari breviter dilatato et reflexo.

Long. 21 mill., diam. 9; aperturæ longit. 8½, diam. 5.

Hab. Zaruma, South Ecuador.

This pretty delicate species is easily recognized by its style of coloration. The transverse series of squarish spots, which are somewhat distant from each other, are very constant. They are not equally remote from one another, but sometimes three or four spots are quite close together and thus form a short almost continuous transverse band; this is particularly the case with the two basal bands on the body-whorl. As the shell is so thin and semitransparent, all the markings are visible within the aperture. The two apical whorls under a strong lens are seen to be minutely granulated, as is the case in many other species.

B. ziegleri of Pfeiffer, var. β ?, Mon. Hel. ii. p. 175; and *B. maculatus*, Lea (?=*B. maculatus*, Reeve), have similar styles of marking.

BULIMUS (LIOSTRACUS) FUSCOBASIS. (Plate XXXIX. fig. 6.)

Testa anguste perforata, elongato-conica, tenuis, semipellucida, nitida, alba, fasciis transversis plus minusve interruptis fuscis (in anfr. superioribus 2, in ultimo 3) ornata, ubique minute spiraliter striata; anfractus 7–8, sensim accrescentes, convexiusculi, ultimus fascia infima haud interrupta ad basim sita; spira elongata, apice parum acuto nigricante; apertura leviter obliqua, intus alba fasciis pellucentibus, longit. totius ⅔ adæquans; perist. tenue, vix expansum, margine columellari reflexo.

Longit. 29 mill., diam. 12; apertura 11 longa, 6½ lata.

Hab. "Tarapoto, Andes of Peru, *Mr. Spruce*" (Mus. Cuming).

This species was labelled in Cuming's collection as *B. lividus*, Reeve. On comparing the two specimens of it with the types of that species, I find certain characters which cannot be reconciled with Reeve's shell.

The form and proportion of the whorls are different, also the length of the spire is greater in the present species, and its black apex and banding are good specific distinctions. The transverse bands in *B. fuscobasis* consist of elongate stripes only interrupted by white spaces generally shorter than the stripes, whilst in *B. lividus* the bands take more the form of quadrate spots widely separated.

B. rectilinearis, Pfeiffer, is also allied to the present species; but it is more sharply conical, shows but the faintest traces of spiral striation, has not a black apex, is differently banded, and the columellar and umbilical characters are not similar.

EXPLANATION OF PLATE XXXIX.

Fig. 1. *Bulimus ochrocheilus*, p. 362.
2. —— *subpellucidus*, p. 364.
3. —— *flavidulus*, p. 364.
4. —— *albolabiatus*, p. 363.
5. —— *orthostoma*, p. 364.
Fig. 6. *Bulimus fuscobasis*, p. 365.
7. —— *æquatorianus*, p. 363.
8. —— *roseolabrum*, p. 362.
9 *a*, 9 *b*. *Helix gealei*, p. 361.

7. Descriptions of three New Species of Birds from the Indian Region. By ARTHUR, Marquis of TWEEDDALE.

[Received April 14, 1877.]

Two of the species about to be described were obtained by Mr. Ossian Limborg on or near the Múlé-it range of mountains in Tenasserim, a locality which had only been once previously visited by a naturalist, namely, the late Colonel Tickell. The third species formed part of a collection of birds made by Mr. Edmund Charles Buxton in the Lampong district of Sumatra.

TRICHOSTOMA LEUCOPROCTUM, n. sp.

♀. Above olivaceous ruddy brown, more rusty at the tips of the upper tail-coverts, greyish on head, a tinge of pale rufous on a narrow frontal band, passing to the pale lores. Two centre tail-feathers umber-brown. The three outer tail-feathers edged pure white on the inner web, the extent of white edging increasing inwards, until the whole inner web of the antepenultimate feather is white, while the fourth is broadly edged white for nearly its whole length on the opposite or outer web. Shoulder of wing rusty olive, the primaries dull rusty brown. Blotch of white on the upper breast, which is dull pale olive-brown, fading into the pure white of the under tail-coverts. Wing rounded; first primary $\frac{1}{2}$ the length of the second, which is $\frac{1}{4}$ inch less than the third, fifth the longest. Tarsus and feet moderately strong for the group.

Length about $6\frac{1}{2}$ inches, wing 3·5, tail 3·0, tarsus 0·9, bill at front 0·63.

Legs and feet grey; irides dark brown.

Hab. Base of the Múlé-it range, Tenasserim. Obtained by Mr. Ossian Limborg.

CHRYSOCOCCYX LIMBORGI, n. sp.

Desc. Above fine rich purple with steel reflections; wings and tail the same, somewhat darker; throat and breast same as the back. Two outer tail-feathers with a similar white tip, and four spots on the outer web of the last, with a short white streak on the inner web opposite each spot, the two together having a tadpole-like outline. Lower breast and vent white, the feathers broadly barred with green and purple, and overlapping, form a succession of regular bands; the bars on the under tail-coverts are broader and of a stronger purple tint. Under-surface of wing white at the inner base of the primaries and secondaries, forming a narrow white bar inside the wing; a pure broad white crescentic collar on the lower nape, commencing low down on the side of the neck. Bill yellow. Legs rich green. Irides red, and a bright crimson orbital skin.

Length about 6 inches, wing 4·0, tail 3·1, tarsus 0·6.

Hab. Base of Múlé-it range, Tenasserim.

This species (which, while closely allied to, differs from *C. xantho-*

rhynchus, Horsf., by having a broad white nuchal collar) was discovered by Mr. Ossian Limborg under the Múlé-it range, east of Moulmain in January of the present year.

BRACHYPTERYX BUXTONI, n. sp.

Above, wings and tail rich ruddy brown; whole under surface silky white, with a faint greyish tinge on sides of breast; thigh-coverts and under tail-coverts white, sullied with ochreous. Space before the eye and sides of head dingy ochreous. Upper tail-coverts rusty brown; wings 2·87 inches, tail 2·30, bill from forehead 0·75, tarsus 1·0, hallux with claw 0·4, middle toe without claw 0·62.

Hab. District of Lampong, S.E. Sumatra; obtained by Mr. Buxton.

Seen from above, this species has the aspect of *B. albifrons*, Boie, ♀, but is of a less ruddy brown.

8. Description of a New Genus and Species of Oscines from Costa Rica. By OSBERT SALVIN, M.A., F.R.S.

[Received April 17, 1877.]

The ornithology of Costa Rica has lately attracted much attention; and it might have been supposed that our knowledge of this subject was tolerably complete. During the past seventeen years many large collections of birds have been made in that Republic; and the results derived from their examination have been published by Dr. Cabanis[1] in Germany, and by Mr. Lawrence[2] in America; while several new species have been brought to notice by Mr. Sclater and myself[3] in this country.

It appears, however, that the mountainous districts of Costa Rica have still attractions left for the naturalist, as will be manifest from the remarkable new form which I now proceed to describe.

PHAINOPTILA, gen. nov.[4]

Rostrum debile, angustum, glabrum, valde aduncatum, maxillæ apice dentato: nares apertæ: setæ rictales breves. Alæ rotundatæ: remex primus longus, dimidium secundi æquans. 2.<3.<4.=5., 4. et 5. longissimi. Acrotarsi breves, integri, sicut in gen. Turdus. *Ptilosis mollis sicut in gen.* Ampelidarum.

Typus et species unica

PHAINOPTILA MELANOXANTHA, sp. n.

Nitente nigra, pectore et abdominis lateribus cum crisso olivaceis, ventre medio ardesiaco: hypochondriis et dorso postico lætis-

[1] See Journ. für Ornith. 1860, pp. 321, 401; 1861, pp. 1, 81, 241.
[2] See Ann. Lyc. Nat. Hist. New York, 1868, p. 86.
[3] See P. Z. S. 1869, p. 416.
[4] φαεινός, *splendens*, et πτίλον, *pluma*.

sime flavis : rostro et pedibus nigerrimis. Long. tota. 9·0, *alæ* 4·0, *caudæ* 3·5, *tarsi* 1, *dig. post. sine ungue* ·5, *rostri a rictu* ·9. *Hab.* Costa Rica (*H. Rogers*).

Mr. H. Rogers, who is now in Costa Rica collecting objects of natural history, shortly after his arrival in that country sent home a box, chiefly of insects, but with them four bird-skins, one of which is the remarkable individual which I exhibit to-night. That it belongs to an undescribed genus there can be little doubt; that it is a member of the family Ampelidæ is perhaps not so certain. The presence of a large first primary shows its position amongst the true Oscines; but the comparative narrowness of the gape, feeble bill, the longer and stouter tarsi than is usual in Ampelidæ, and the fact of the front of the tarsus being covered by a single scute suggest that the bird may prove to be an aberrant member of the family Turdidæ. The wing-formula is quite that of *Ptilogonys*, to which genus the glossy plumage and some of the characteristics of the coloration suggest an affinity; and these characters have induced me to place *Phainoptila* for the present near *Ptilogonys* in the family Ampelidæ.

May 1st, 1877.

Prof. Newton, F.R.S., V.P., in the Chair.

Mr. Howard Saunders exhibited and made remarks on some nests and eggs of the Orphean Warbler (*Sylvia orphea*) from the vicinity of Malaga, Spain. Amongst the eggs in each nest were one or two of larger size, which were supposed to be possibly eggs of the Cuckoo.

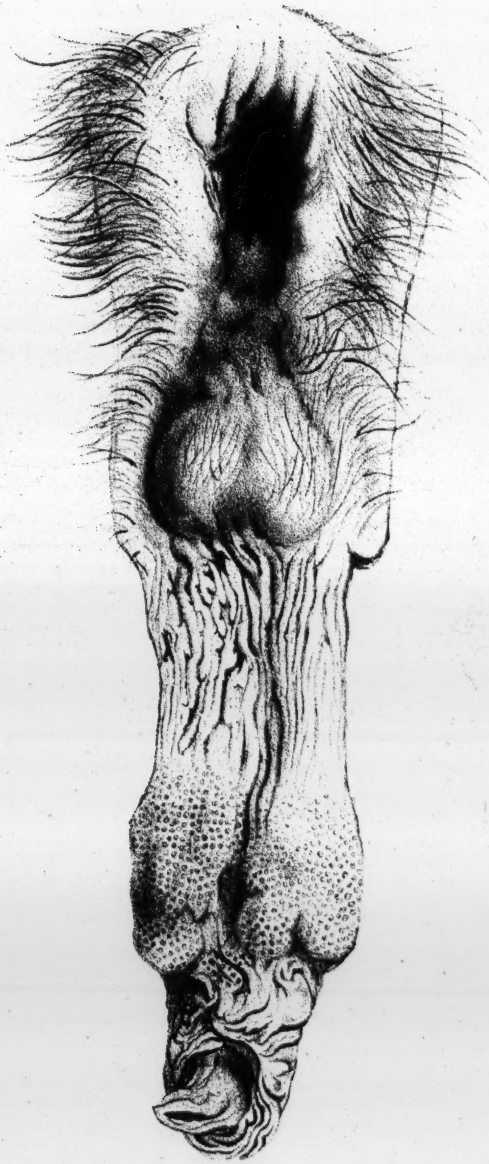
Mr. Saunders also exhibited two skins of Dupont's Lark (*Alauda duponti*) from the same locality.

Prof. Mivart, F.R.S., read a memoir on the axial skeleton of the Pelecanidæ, selecting *Pelecanus* as his type and standard of comparison. Prof. Mivart first compared *Pelecanus*, as regards its axial skeleton, with *Struthio* and the other Struthionidæ, and then compared the other Steganopodes with it and with one another.

This memoir will be published in the Society's 'Transactions.'

The following papers were read :—

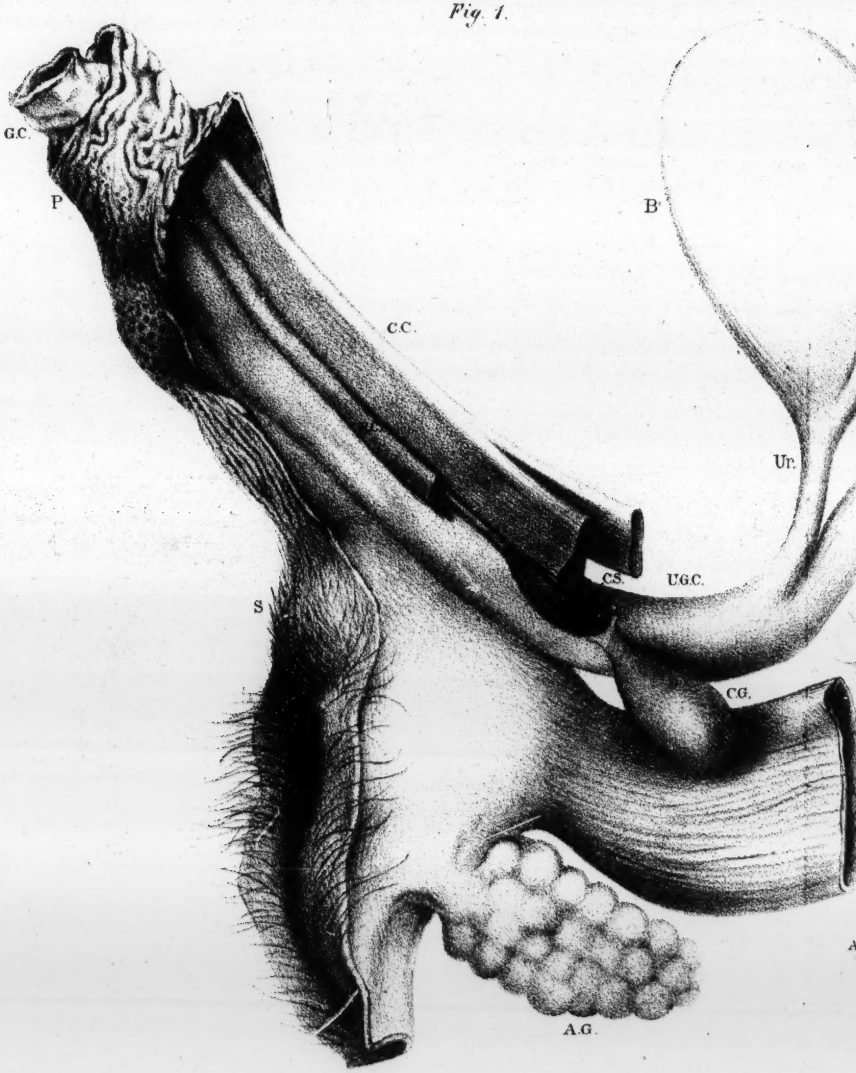




A.H.Young M.B. del. J.Smit. lith. M&N Hanhart imp.

ANATOMY OF HYÆNA CROCUTA.

Fig. 1.



A.H.Young MB del. J.Smit lith

ANATOMY OF HYÆNA

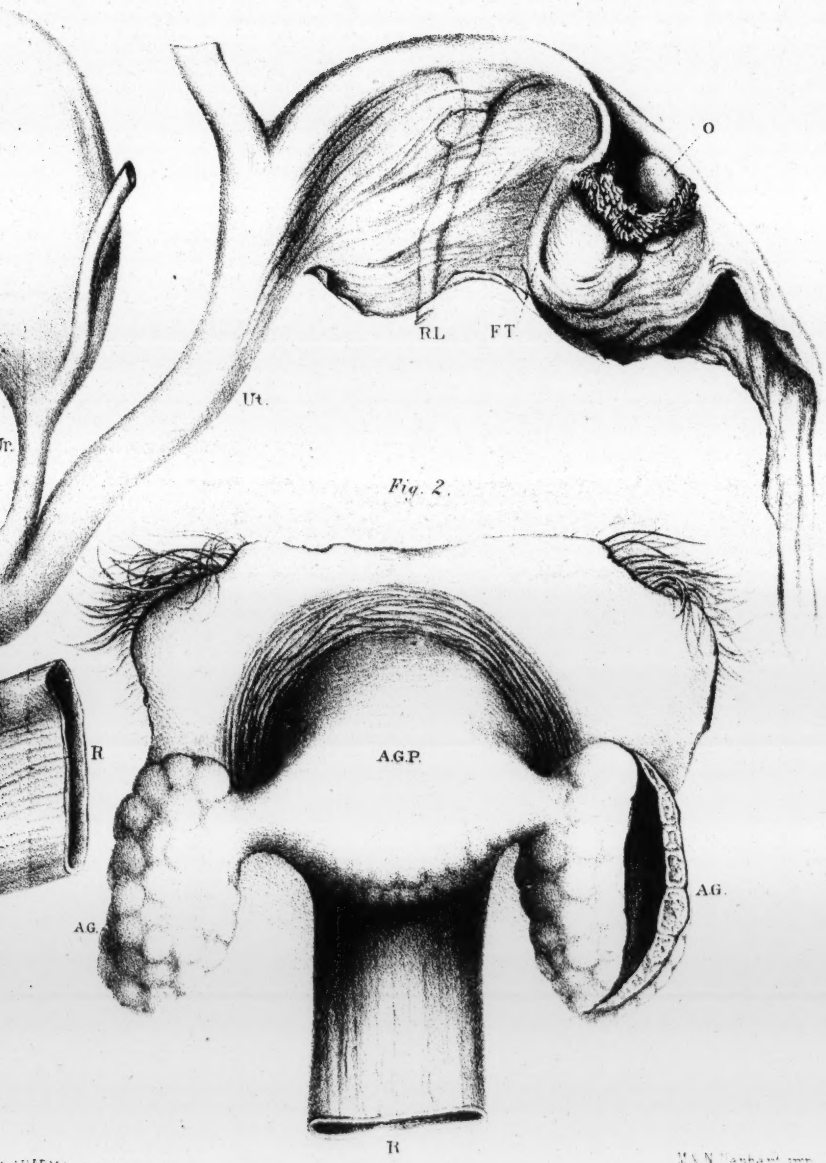


Fig. 2.

HYÆNA CROCUTA.

M.& N. Hanhart imp.

1. On the Female Generative Organs of *Hyæna crocuta*. By M. Watson, M.D., Professor of Anatomy, Owens College, Manchester. Communicated by A. H. Garrod, M.A.

[Received April 11, 1877.]

(Plates XL., XLI.)

Before entering on the subject of this communication, I desire to state that to Mr. A. H. Garrod is undoubtedly due the merit of having first recognized the peculiar characteristics of the female generative organs of *Hyæna crocuta*, he having some time since examined a specimen which died in the Society's garden. The structure of these organs, however, struck him as so peculiar that he hesitated to publish the account of his dissection until such time as he should be able to verify his observations by the examination of a second specimen. Meanwhile I obtained the specimen the dissection of which furnishes the subject matter of this communication, and, feeling uncertain on account of the very unusual condition of the female organs whether they were to be regarded as normal, applied to Mr. Garrod for information. He at once in the most generous manner forwarded to me for comparison what remained of his own dissection, and, in the note which accompanied it, showed that he had clearly recognized the peculiarities in question.

External parts.

The appearance of the perineal region of the female *Hyæna crocuta* is such as to have led me in the first instance to believe the animal which I examined to be one of the opposite sex. This belief was based upon the following appearances:—(1) the absence of any well-marked vulva such as one generally sees in female Carnivora; (2) the presence of an elongated pendulous penis-like body, surrounded by a prepuce, and having a glans perforated by a single canal; and (3) the presence of two projections below the anus, which at once called to mind the appearance of the scrotum in many Carnivora. I pass to the description of these parts.

Clitoris.—The pendulous penis-like body, viewed in the light of the subsequent dissection, we must regard as the clitoris. It projects downwards and forwards from the level of the perineum, measures 2 inches in length and 1 inch in diameter, and consists of a central body, the glans clitoridis, which is surrounded by a thick fleshy prepuce. The colour of the glans is bluish toward the tip, where it is exposed, but flesh-coloured under cover of the prepuce. Its extremity is obliquely truncated from before backward, so that the posterior border of the glans is more prominent than the anterior. It is moreover perforated by a single canal of so small a size that one is at first sight induced to believe that he is dealing with the extremity of the male urethra, an error only corrected by an examination of the internal organs. The prepuce consists of a double

fold of thick integument which, rising from the level of the perineum, passes as far forward as the extremity of the glans, and is then reflected to the base of that body to become continuous with its cutaneous covering. It is attached by a distinct frænum to the pointed posterior angle of the glans, but is otherwise free, very loose, and rugose, and can be readily drawn out so as completely to conceal the glans of the clitoris. Under ordinary circumstances, however, it would appear that the preputial integument is thrown into circular rugæ around the clitoris, and thus leaves the extremity of the glans uncovered. The colour of the skin forming the prepuce resembles that of the glans, being bluish externally, but where it comes into contact with the glans it assumes the flesh-colour of the corresponding portion of that body.

Labia?—The integument of the perineum, continuous with that which forms the prepuce, is of the same bluish colour as high as the lower margin of the anus, where it changes its appearance. The whole of the skin in this region is devoid of hair and, close to the base of the clitoris, is thickly studded with numerous little depressions. These depressions equal in size the head of a pin, and are so closely placed that the intervals between them are less than the depressions themselves. The integument of the perineal surface of the prepuce is also studded at its base with these depressions, although here they are by no means so numerous as in the perineal region. They are entirely absent from the abdominal surface of the prepuce, as also from the upper part of the perineum. Immediately above (perinead) the clitoris the skin is thrown into two longitudinal folds which bound a shallow groove. These folds are by no means well marked, but correspond in position to that of the labia in other animals. Should they, as I believe they do, represent these structures in this animal, the clitoris occupies the usual position with regard to them; that is, it lies in the anterior commissure. It is to be observed, however, that there is no vaginal aperture between the folds. The integument forming them possesses the structure already described; but between their upper extremities and the margin of the anus, the skin, although devoid of hair, loses the little depressions already referred to.

Scrotal pouches.—The cutaneous elevations which I have so named are situated immediately below the anus, one on either side of the middle line, and remind one, forcibly in respect of position, of the scrotum in many of the Felidæ. Each is about the size of a filbert, and, unlike the rest of the perineum, is covered with delicate hair of a light brown colour. The presence of these pouches adds much to the deceptive appearance of the female, and, combined with the other peculiarities, renders the identification of the sex a matter of difficulty. These pouches when cut open are seen to be mere pouch-like elevations of the skin, and do not lodge any part of the generative apparatus. Each is filled with a little mass of subcutaneous fat.

Anus and anal-gland pouch.—Immediately above the scrotal pouches the surface of the skin is somewhat depressed, the margins

of the depression being covered with hair of the same colour as the surrounding parts. In this depression are situated two apertures, that of the anus, and that of the anal-gland pouch, the latter being situated between the former and the root of the tail. The lower margin of the anus is placed an inch above the scrotal pouches, the skin between them being black. The anus is separated by a transverse fold of integument from the anal-gland pouch. The skin of the latter is smooth and devoid of hair, with the exception of three small tufts, one of which springs from the middle of the upper wall of the pouch, and one from each of its inferior external angles. At the bottom of the pouch, on either side of the middle line, is a single aperture of sufficient size to admit a quill. These are the openings of the ducts of two large anal glands; and stretching across the bottom of the pouch from one of these openings to the other is a transverse line of perforations which correspond to the excretory ducts of a number of small isolated glandules to be subsequently described.

Having now described the appearances of the external parts, I pass on to the description of the

Internal Organs.

Rectum and Anal Glands.—The walls of the rectum are thick, being provided with a strong layer of longitudinally arranged muscular fibres. It has the usual relation to neighbouring viscera, and terminates immediately below the pouch which receives the excretory ducts of the anal glands. This pouch has a transversely oval form, is $2\frac{1}{3}$ inches in breadth, and is depressed from the level of the perineum to the depth of $1\frac{1}{3}$ inch. The anal glands which pour their secretion into it are two in number; but in addition to these there is a belt of isolated glandular follicles which extends across the bottom of the pouch. Each anal gland is situated above and to the outer side of the rectum, and has, when denuded of the surrounding connective tissue, a botryoidal appearance, by reason of the presence of a number of little grape-like projections on its surface. Each is roughly pyriform, and has the apex directed forward and upward, the base backward and downward. The inner side of each gland is applied to the corresponding angle of the anal pouch; and from this surface of the gland the duct is given off to open into the pouch as previously described. Each of the glands measures $2\frac{1}{3}$ inches from base to apex, and $1\frac{1}{2}$ inch in diameter at the base. When cut open, each is seen to consist of a thick glandular wall, enclosing a single cavity of large size which communicates by means of the opening already described with the anal-gland pouch. The cavity of the gland was filled with a thick yellowish secretion, evidently the product of the glandular walls, of the consistence of butter, and having a very offensive smell. A quantity of muscular fibres apparently continuous with those of the sphincter ani surrounds each gland, and evidently acts as a compressor. The belt of glandular follicles above referred to as extending across the bottom of the anal-gland pouch, consists of a large number of isolated glands, each about

the size of a small pea, and each provided with a single duct which perforates the fundus of the pouch by means of one of the little apertures previously described.

Bladder and Urethra.—The bladder is small in size, and regularly pyriform. It passes insensibly into the urethra; so that it is difficult to say where the former ends and the latter begins. It is, with the exception of the base, entirely covered with peritoneum, which forms three ligaments to the viscus. Two of these pass upward to connect it with the uterine cornua, and one downwards to attach it to the anterior abdominal wall. The ureters are provided with thick muscular walls, and enter the bladder close to the orifice of the urethra. This tube measures only $1\frac{1}{2}$ inch in length, and passes backwards, resting against the corpus uteri to open into the uro-genital canal, its orifice being separated from the os uteri by a single semilunar fold of mucous membrane.

Ovaries.—Each of these bodies is of an oval flattened form, having its long axis placed transversely, and its anterior and posterior surfaces somewhat flattened. Each measures rather more than half an inch in length and about a fourth of an inch in thickness. The ovary is retained in position by two stout ligaments, one of which is attached to the inner, the other to its outer extremity. The former attaches the ovary to the outer extremity of the corresponding uterine horn, and measures half an inch in length. By means of the latter, which measures 5 inches in length, the ovary is fixed to the posterior surface of the diaphragm. Each of these ligaments consists of a fibrous cord, and each is covered by peritoneum. The ovary is placed in a peritoneal pouch of size sufficient to contain a large walnut. The opening of this pouch is considerably narrowed, and in the natural position of the parts is directed upwards (towards the spine of the animal) so that ova, as they pass from the surface of the ovary must almost necessarily be caught by it. This pouch is formed by a reduplication of the broad ligament of the uterus, and appears to be, so to speak, suspended from the uterine and diaphragmatic ligaments of the ovary, hanging vertically below that organ, which is placed just within the entrance to the sac. The posterior free margin of the pouch is formed by the ovary together with its uterine and diaphragmatic ligaments, whilst its anterior margin is formed by the free edge of the peritoneal fold and, to a less extent, by the fimbriated extremity of the Fallopian tube.

Fallopian Tube.—In order to be explicit, I must here state that by the term Fallopian tube I understand so much of the oviduct as extends from its fimbriated extremity to the point of attachment to it of the uterine ligament of the ovary. That portion of the oviduct which extends from the attachment of this ligament to its junction with its fellow of the opposite side, I regard as constituting the horn of the uterus. The Fallopian tube, as thus defined, measures between $2\frac{1}{2}$ and 3 inches in length, and describes a U-shaped flexure from the one extremity to the other, the concavity of the U in the natural position of the parts being directed upward. The free extremity of the Fallopian tube lies in contact with the anterior free margin of

the peritoneal ovarian pouch, and is provided with numerous elongated fimbriæ. From this extremity the tube passes downwards lying in the anterior wall of the sac as far as its floor, where it turns upward and then comes to lie in the posterior wall of the pouch, terminating by becoming continuous with the corresponding uterine horn at the point of attachment to the latter of the ovarian ligament. The tube thus accommodates within the concavity of its flexure the fundus of the ovarian pouch.

Uterus.—The uterus consists of a central body and two horns. Each horn measures $3\frac{1}{2}$ inches in length, and extends from the uterine ligament of the ovary as far as the middle line, where it meets with its fellow to form the corpus uteri. In this course it is contained between the folds of the broad ligament, and increases gradually in calibre from without inwards. Midway between its commencement and termination there is attached to the horn a stout fibrous cord, which evidently represents the round ligament of the uterus. When traced backwards it is seen to enter the inguinal region; but its exact attachment in this locality I could not determine, in consequence of the organs having been removed from the body before I was aware that the generative organs of this Hyæna presented any unusual arrangement. At the point of attachment of the round ligament to the left uterine horn there was a small pedunculated hydatid.

The body of the uterus is formed by the junction of the right and left horns, and lies between the bladder and the rectum. It measures 5 inches in length from the junction of the horns to the opening of the os uteri into the urino-genital canal. That the whole of this is to be regarded as corpus uteri, and not as constituting any part of the vagina, is proved by the absence of any constriction in its interior which might correspond to an os uteri, the tubular body of the uterus remaining of the same calibre, and having the walls of uniform thickness down to its opening into the urino-genital canal. What must, therefore, be regarded as the os uteri is the constricted opening by means of which the uterus communicates with the canal common to both urinary and generative organs. At this point there is a thick semilunar fold of mucous membrane, the concavity of which is directed backwards, and its margins attached to the walls of the urino-genital canal. It is placed horizontally, having its surfaces directed upward and downward, and intervenes between the opening of the urethra above and that of the os uteri below it into the common canal. Internal to this fold is the uterus; external to it is the urino-genital canal; for, as we shall see presently, there is in this animal a complete absence of any differentiation of vagina from urethra. The mucous lining of the uterus is thrown into well-marked longitudinal rugæ.

Urino-genital Canal.—As already stated, the uterus and urethra open into a common canal. This, the urino-genital canal, extends from the junction of the two tubes to the extremity of the clitoris, and measures rather more than 8 inches. In this course it describes a wide curve with the convexity backward, corresponding of course to that of the perineum upon which it rests. The canal may, for the sake

of clearness in description, be divided into two parts—(*a*) the part extending from its commencement as far as the base of the clitoris, and (*b*) a part extending from base to apex of the clitoris. The first part measures 1½ inch in length, and possesses walls of considerable thickness, these being provided with a thick layer of circularly arranged muscular fibres. Where this portion of the common canal becomes continuous with the second portion its floor is pierced by the ducts of two large glands.

Cowper's Glands.—These, which appear to correspond to Cowper's glands as figured by Daubenton in the male *Hyæna striata*, lie one on either side of the common canal, the base of the gland being opposite the junction of the urinary and genital passages, whilst from its apex the duct above mentioned is given off. Each gland is pyriform, somewhat flattened, and measures 1½ inch in length, and ¾ of an inch in greatest breadth. When cut into, the gland is seen to be solid, and recalls to mind the appearance of a section of salivary gland.

The second portion of the urino-genital canal extends along the under surface of the clitoris, lying along the lower border of the united corpora cavernosa of that body, to which it is attached, and finally pierces the glans clitoridis by an opening of small size, which might readily be mistaken for the termination of the male urethra. The walls of this portion of the canal are much thinner than those of its first part, and consist merely of mucous membrane, with a substratum of connective tissue. The mucous membrane of both parts of the common canal is extremely distensible, and is thrown into longitudinal rugæ, which are quite continuous at the os with those previously described in the uterus.

Clitoris.—The clitoris measures 6½ inches in length from root to tip. It is composed of two corpora cavernosa, which form the bulk of the organ. Corpora spongiosa, however, are not absent, although they are altogether subordinate in size of the corpora cavernosa. Each corpus cavernosum is a thick laterally compressed band of erectile tissue enclosed in a fibrous capsule, and, except at the root, where it is attached to the corresponding ischium and forms the crus, is in contact with its fellow of the opposite side along the whole length of the clitoris. At the extremity of the clitoris the two corpora cavernosa terminate abruptly and form the upper hard portion of the glans, the lower portion of that body being formed by the walls of the urino-genital canal.

The corpora spongiosa are two in number, but of small size. Each is pyriform, and measures about an inch in length. Each is situated below and in contact with the corresponding crus clitoridis, and has its narrow end directed forwards. This extremity terminates in a vein of considerable size, which runs forward and unites with its fellow of the opposite side. The single vessel is then continued onward, lying in contact with the lower border of the united corpora cavernosa, and above the urino-genital canal as far as the glans. Its mode of termination I could not make out; but in all probability it terminates in branches which enter the corpora cavernosa; at least, many branches were given off from it to

these structures. The two spongy bodies of opposite sides are quite distinct from one another, and do not communicate except through the vein just described; nor do they take any part in the formation of the glans clitoridis, that body being formed entirely by the corpora cavernosa and the walls of the urino-genital canal. It will also be observed that the spongy bodies are placed altogether *above* that canal, and that consequently the latter is not surrounded by the spongy structure in any part of its course. An artery of considerable size enters the bulbous extremity of each spongy body.

Two muscles are met with in the dissection of the clitoris. The one is the erector clitoridis, which is of large size and covers the crus, as well as the bulb of the corpus spongiosum, in the usual manner. The other is the retractor clitoridis. The origin of this muscle I could not determine, as the parts had been detached from the bones; but in all probability it arose either from the ischium or pubis. The muscles of opposite sides pass forward in contact with one another, and form two cord-like bands which lie along the lower borders of the corresponding cavernous bodies; and each is inserted by means of an aponeurotic structure into the corresponding corpus cavernosum immediately behind the glans. These muscles are doubtless retractors of the glans within the prepuce. A large artery, vein, and nerve run along the outer side of each cavernous body, and can be traced as far as the base of the glans. There is no bone in the clitoris.

If, now, we compare the description above given of these parts in *Hyæna crocuta* with that of the corresponding organs in other species, we find, with regard to the anal-gland pouch, that its presence has been proved by Daubenton[1] in the *Hyæna striata*, by Murie[2] in the *Hyæna brunnea* and *crocuta*, and by Prof. Flower[3] in the allied genus *Proteles*. With regard to *H. crocuta*, its presence has been denied by Busk[4]; but Dr. Murie's investigations, along with my own, now leave, I think, no doubt regarding this point. Anal glands are present in all of these animals, but differ somewhat in respect of number in different species. In *H. striata* Daubenton describes and figures *two* on each side of the anal-gland pouch. The anterior of these corresponds most closely with that which is present in *H. crocuta*, the posterior having no representative in the latter species. He further describes in *H. striata* a quantity of isolated follicles which have almost the same arrangement as the transverse belt of glandules which I have described as opening into the anal-gland pouch in *H. crocuta*. Dr. Murie describes in *H. brunnea three* anal glands on each side of the rectum, but makes no mention of isolated glandules in relation to the fundus of the anal pouch. Lastly, in *Proteles two* anal glands of large size are described by Prof. Flower, in addition to a central glandular mass covering the bottom of the anal pouch. The large glands correspond almost exactly in shape with those I have described in *H. crocuta*; and although I am in doubt, from his description, of the exact appearance of the central glandular mass, it appears to correspond closely to the belt of

[1] Buffon's Hist. Nat. tom. ix.
[2] Trans. Zool. Soc. vii. p. 503.
[3] Proc. Zool. Soc. 1869, p. 493.
[4] Quoted by Dr. Murie in his paper.

follicles above referred to. In respect therefore of the anal pouch and glands *H. crocuta* agrees more closely with *Proteles* than with any species of its own genus.

Turning now to the female organs of other species, and comparing them with those of *H. crocuta*, which have not, so far as I know, been previously described, I find that Owen[1] gives a description of the ovary and its containing pouch, which almost exactly corresponds to that given above. He does not, however, say to what species the description applies, merely stating that it refers to the genus *Hyæna*. Murie[2] figures the ovary of *H. brunnea*, but gives no description; and it is difficult to decide from the drawing as to whether the organ is contained in a pouch, similar to that found in *H. crocuta*, or the contrary. The uterus of *H. crocuta* appears to correspond accurately in form to that of *H. brunnea* as figured by Murie[3], agreeing with it especially as regards the elongated form of the corpus uteri. The os uteri of *H. crocuta* is smooth and non-papillose, in which respects it agrees with Owen's[4] generic description. The characteristic peculiarities of the internal female generative organs of *H. crocuta* are therefore to be found in the presence of the single passage leading from the os uteri to the exterior of the body for the conveyance of both the urinary and genital products; in none of the species hitherto described does the same arrangement obtain. John Hunter[5] states that in *H. striata* the common vagina, by which term I understand him to refer to the urino-genital canal, is only $1\frac{1}{2}$ inch in length, whilst the proper vagina measures 5 inches. This description agrees with Murie's figure and description of the same parts in *H. brunnea*. He describes the urethra as opening externally in the anterior angle of the slit-shaped vulva, the opening being distinct from that of the vagina. In both *H. striata* and *H. brunnea*, then, the female urethra extends from the neck of the bladder to the vulva, or, at least, close to it, leaving the urino-genital canal only about an inch in length. In *H. crocuta*, on the other hand, as we have seen, the urethra opens into the urino-genital canal close to the os uteri, and consequently we have the urino-genital canal measuring about 8 inches in length. Moreover in *H. crocuta* we have two Cowperian glands of large size opening into this canal, glands which appear to be absent in the other species of the genus; at least, they have neither been described nor figured by Hunter, Owen, or Murie.

The external parts of *H. crocuta* also differ materially from those of allied species. We have before drawn attention to the enormous size of the clitoris, and its perforation by the urino-genital canal in this animal, as well as to the absence of any trace of a vulva properly so called. In respect of each of these points, *H. crocuta* appears to differ from other species.

Hunter[6] says of *H. striata*:—"Below the anus opens the vagina: there are no external lips ending in a projecting point, as in many

[1] Anat. of Vertebrates, vol. iii. p. 701.
[2] Trans. Zool. Soc. vol. vii. pl. lxiii. fig. 1, o.
[3] Trans. Zool. Soc. vol. vii. pl. lxiii. fig. 1, v.
[4] Anat. of Vertebrates, vol. iii. p. 701.
[5] Essays and Observations, by Owen, vol. ii. p. 57.
[6] *Ibidem.*

other animals, but a round hole similar to an anus. Just within this is the clitoris, which points forwards like a short, blunt tongue." Murie[1] figures the external female organs of *H. brunnea*, and describes the "vulva as being slit-shaped, $\frac{1}{8}$ of an inch in length, and with the urethral outlet placed in its anterior angle." He makes no mention whatever of the clitoris. Now it is impossible to doubt that, had the clitoris presented the large size in either of these species that it does in *H. crocuta*, one or both of the observers just named would have referred to it. Moreover the presence in both these of a vulva presenting the usual appearance, and particularly referred to by the anatomists who describe them, shows that in this respect also *H. crocuta* differs much from its congeners. The perforation of the clitoris by the urino-genital canal is an arrangement which, so far as I am aware, does not occur in any other animal. It is not by any means exceptional that the female *urethra* should groove or even perforate the clitoris; but the fact that the excretory canal which is common to both the urinary and genital organs should do so is, I believe, extremely uncommon. Owen[2] says that, with the exception of the monotremes, "in all mammals both urine and semen are carried out by the urethral canal in the male; and in some Insectivora and Quadrumana the clitoris in the female is similarly traversed by a canal, *which here, however, is exclusively for the urine*. The vaginal orifice intervenes between the prominent and perforate clitoris and the anus."

The arrangement of the female organs in *H. crocuta* is such as to give them a great resemblance to those of the males in other species. Leuckart[3] figures the passages of the male *H. striata*, and shows that in connexion with the floor of the prostatic portion of the urethra there is a small flask-shaped uterus masculinus. Now, if we suppose this uterus masculinus enlarged to the size of the uterus, above described, of the female *H. crocuta*, we shall, in the absence of a prostate gland, have an almost identical arrangement of the excretory passages of both sexes, an agreement which is confirmed by the position and large size of the Cowperian glands in both. I have not had an opportunity of examining the male organs of *H. crocuta*; but, from Prof. Flower's remarks[4] as to the form of the penis in that animal, I am inclined to think that it closely resembles the clitoris of the opposite sex; and an examination of Dr. Murie's drawing of the external parts of a young male *H. crocuta* confirms this opinion. Add to which that, as I have already stated at the commencement of this paper, the resemblance of the external parts in general in both sexes is so close that it is difficult, if not impossible, to distinguish them, and we have, I think, an explanation of the notion entertained by the ancients regarding these animals—namely, that they were hermaphrodites. As showing how easily even those who are most familiar with these creatures may be misled, I may mention that the keepers of the

[1] Trans. Zool. Soc. vol. vii. p. 504. fig. 1.
[2] Anat. of Vertebrates, vol. iii. p. 609.
[3] Cyclopæd. of Anat. vol. iv. Art. "Vesicula prostatica."
[4] Proc. Zool. Soc. 1869, p. 493.

animal examined by me were both of opinion that it was a male, but acknowledged that they had very great difficulty at any time in deciding as to the sex in this species. The theory of the ancients regarding their sexual peculiarities, moreover, obtains in a popular form at the present day, as I have it on the authority of a gentleman who resided for some time in South Africa that the Dutch hunters in that region are still of the same opinion. For my own part, I see no reason to doubt that, just as under many popular ideas there lies an element of truth, so beneath the extraordinary belief regarding the sexual relations of these animals a physiological fact may be concealed. There *may* be some truth in the assertion by the South-African hunters, and which I give on the authority of the gentleman above referred to, that two individuals of the same sex have been seen to couple. There appears to me to be nothing in the arrangement of the parts to prevent two females in indulging in what to both may afford sexual gratification. It is not impossible that an organ of the size of the clitoris in these animals, almost entirely composed of erectile tissue, and richly supplied with blood, may afford the means of sexual gratification to two individuals of the same sex, especially during the period of rut. It is a matter of daily observation that among animals during the period of heat the mere contact of individuals of the *same* sex affords pleasure; and if this contact, by reason of the anatomical arrangement of the parts, be permitted to be more complete, as is apparently the case in *H. crocuta*, I see no reason to doubt that occurrences of this kind, taken in conjunction with the difficulty of distinguishing the sexes, may have led to the foundation of the hermaphroditic theory with reference to these animals.

It would not be uninteresting, in connexion with the arrangement of the urino-genital canal perforating, as it does, the clitoris, to know somewhat regarding the condition and size of the young at birth. The canal itself is dilatable enough; but the opening at the extremity of the glans scarcely appears sufficiently roomy to allow of the passage of young of such size as, judging from those of other animals at the same period, those of *H. crocuta* must be. The mode of coupling of these animals also is worthy of observation, as, from what has been stated, it will be seen that the arrangement of the parts is not such as to facilitate this act.

The form and size of the cæcum, and mode of branching of the aorta, in *H. crocuta* are exactly the same as has been described by Daubenton in *H. striata*, and by Murie in *H. brunnea*.

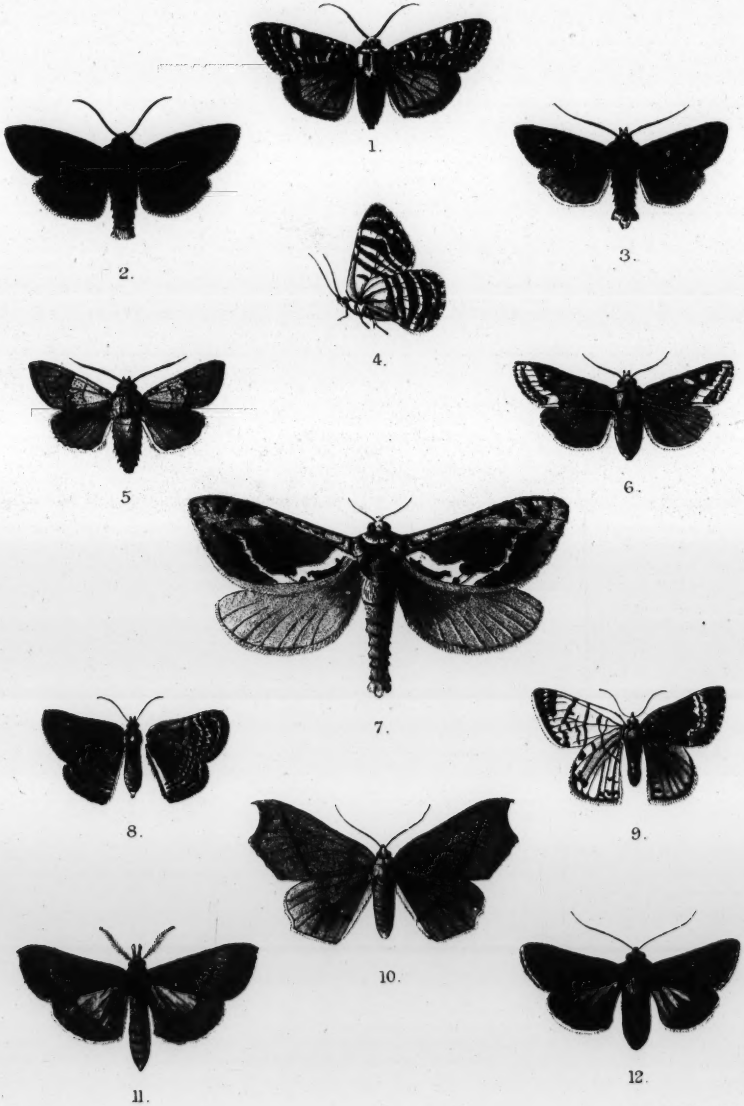
In conclusion, I have to state that my best thanks are due to my friend Dr. Alfred Young for the very excellent drawings which accompany this paper.

EXPLANATION OF PLATES XL. & XLI.

PLATE XL.

View of the female perineum and clitoris of *Hyæna crocuta*. From above downwards are seen the orifice of the anus, as well as of the anal-gland pouch; below this is the pair of elevations referred to under

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E. A. Smith del et lith.

Mintern Bros. imp

MOTHS OF NEW ZEALAND.

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E.A. Smith del. et lith. Mintern Bros. imp.

MOTHS OF NEW ZEALAND.

the name of "scrotal projections" in the paper. Below these is the bare perineal integument with a median groove which *may* represent the vulva. Lowest of all is the clitoris, surrounded by its prepuce, and perforated at the extremity of the glans by the urino-genital canal.

PLATE XLI.

Fig. 1. Female generative organs and extremity of rectum of *Hyæna crocuta*. G.C. Glans clitoridis perforated at its extremity by the urino-genital canal. P. Prepuce surrounding the glans clitoridis. C.C. Corpora cavernosa clitoridis, separating posteriorly to form the crura. R.C. Retractor clitoridis muscle. C.S. Corpus spongiosum clitoridis; a small artery is seen entering its base. CG. Cowper's gland, opening into UGC, urino-genital canal, which is seen to extend forward from the junction of the urethra and uterus to the extremity of the clitoris, lying underneath the corpora cavernosa. UR. Urethra. B. Bladder. UT. Uterus, formed by the junction of the two cornua. R.L. Round ligament of uterus. F.T. Fallopian tube, terminating in a fimbriated extremity. O. Ovary, lying in its peritoneal pouch. R. Rectum. A.G. Anal gland of left side, opening into the anal-gland pouch, which, *in this position* of the parts, is seen. S. Scrotal projection, seen from the side.

Fig. 2. Posterior extremity of rectum and anal glands, seen from above. R. Rectum. A.G.P. Anal-gland pouch, which communicates with A.G, A.G, the anal glands.

Between the anal glands of opposite sides a belt of glandular follicles is seen to cover the fundus of the pouch.

2. On two Collections of Heterocerous Lepidoptera from New Zealand, with descriptions of new Genera and Species[1]. By ARTHUR G. BUTLER, F.L.S., F.Z.S.

(Received 11th April, 1877.)

(Plates XLII. & XLIII.)

In my list of the "Lepidoptera of New Zealand," published in the Insect portion of the 'Voyage of the Erebus and Terror,' I was unable, from the small attention which up to that time I had paid to the Heterocera, to determine critically the correct genera to which many of Walker's species were referable; I had, moreover, little time at my disposal to go through the whole collection with Guénée's descriptions; and therefore I was compelled merely to introduce them into their places, in the belief that this author had made strenuous efforts to determine the species described by Walker. That this belief was (to all appearance) unsupported by fact will, I think, be made sufficiently clear in the following synonymic revision of the two small collections recently brought to England by Dr. Hector and Mr. J. D. Enys; I can only discover two or three instances in which species here enumerated have been identified, and in the case of *Nitocris comma* incorrectly.

M. Guénée says, "I am able to recognize some of them; but the

[1] The types of new species have been presented to the collection of the British Museum.

greater part of those sent to me seem new. It may be that the locality where Mr. Fereday collects is different from those which Messrs. Bolton, Colenso, and Sinclair visited, or that I have not been able to recognize many of them, from the too often little-precise descriptions by Mr. Walker." It is possible that, as I constantly have Mr. Walker's types to compare with his descriptions, it may be easier for me to determine those which we do not possess than it is for a foreigner; but I can scarcely comprehend M. Guénée failing to recognize so many as he has done, if he really tried to identify them.

Mr. F. Moore has very kindly assisted me in the determination of some of the more obscure genera, chiefly of Noctuites and Geometrites, to which groups I have as yet been able to devote but little time.

Sphingidæ.

1. Protoparce distans.

Sphinx convolvuli, var. *distans*, Butler, Zool. Ereb. and Terror, Ins. p. 30 (1874).

Hawk's Bay, North Island. In colls. Dr. Hector and J. D. Enys, Esq.

Ægeriidæ.

2. Ægeria tipuliformis.

Sphinx tipuliformis, Linnæus, Faun. Suec. p. 289, n. 1096.

In colls. Dr. Hector and J. D. Enys, Esq.

Nyctemeridæ.

3. Secusio annulata.

Leptosoma annulatum, Boisduval, Voy. de l'Astrolabe, pl. v. fig 9 (1853).

In colls. Dr. Hector and J. D. Enys, Esq.

This species certainly agrees better with Walker's genus *Secusio* than with *Nyctemera*, to which hitherto it has been referred.

Hepialidæ.

4. Charagia virescens.

Hepialus virescens, Doubleday, Dieff. N. Zeal. ii. App. p. 284, n. 114 (1843).

North Island. In colls. Dr. Hector and J. D. Enys, Esq.

One of Dr. Hector's examples is of a sandy ochraceous colour; but in all probability this coloration is not natural.

Felder's *Charagia fischeri* is the *C. rubroviridans* of Walker.

5. Charagia hectori, n. sp.

Size, form, and general coloration of *C. rubroviridans*, but the primaries covered all over with transverse interrupted ferruginous-bordered whitish bands. Thorax and primaries sap-green, the latter crossed by about five macular transverse bands, but ill-defined on

the basal half of the wing; secondaries and abdomen above salmon-colour; primaries below with the basal area, excepting on costa, salmon-colour, the transverse markings only visible through the wing, secondaries varied with sap-green. Expanse of wings 6 inches 2 lines.

North Island. From Dr. Hector's collection.

6. PORINA ENYSII, n. sp. (Plate XLII. fig. 7.)

Primaries above smoky brown, varied with testaceous, black, and silvery white; costal area and basal third of wing whitish, mottled with brown and black; internal area white, interrupted upon the margin and towards the base by a claviform longitudinal black streak, followed by a small rounded black spot; discal area crossed by a broad brown band which terminates below in a black inverted cone, and is bounded externally by a connected transverse arched series of blackish spots; immediately beyond the black spots there is an irregular transverse whitish area (quite white at inner margin) which encloses a second, and submarginal, series of blackish spots; outer border, fringe, and veins testaceous; secondaries testaceous, with darker veins and fringe; thorax smoky brown; head testaceous; collar dark brown in front, very hairy, the hairs on the posterior border white at the tips; abdomen testaceous: wings below sordid testaceous, veins dusky, costa of primaries with two brown spots just beyond the middle; body sordid testaceous below, the pectus dusky in front. Expanse of wings 2 inches 7 lines.

North Island. From the collection of Mr. J. D. Enys.

Porina Enysii is most nearly allied to the *P. mairi* of Dr. Buller, but is very distinct; unfortunately the type is somewhat rubbed, so that it is possible that there may be markings upon the centre of the basal area of the primaries which I have failed to detect; the broad discal band and the submarginal series of reniform blackish spots, however, will at once serve to distinguish the species from all previously known forms.

7. PORINA CERVINATA.

Elhamma cervinata, Walker, Lep. Het. Suppl. ii. p. 595.

South Island. In colls. Dr. Hector and J. D. Enys, Esq.

PSYCHIDÆ.

8. PSYCHE UNICOLOR, n. sp.

Uniformly grey, the primaries of a slightly more brownish tint than the secondaries, and with a blackish costal edge; the secondaries subhyaline: body clothed with long woolly hair. Expanse of wings 1 inch.

South Island. From the coll. of J. D. Enys, Esq.

The case of *P. unicolor* is fusiform, truncated and open at the apex, through which (after the exclusion of the moth) the dark mahogany-brown pupa-skin projects; it is composed of short pieces of grass-stalks placed longitudinally, the largest being at the base, the smallest (mixed with small chips and silk) at the apex. Found on fences, gate-posts, rails, &c.

A second form of case occurs in Mr. Enys's collection; larger, longer, fusiform, of a woolly texture, grey in colouring, with a tendency to darker zones at unequal distances. It is found chiefly on willows, sometimes on *Cupressus*. Unfortunately the moth does not accompany it in sufficiently good condition for description; it is a species of *Clania*. Having discovered the type of *Morova subfasciata* of Walker, I find it to be a large example of *Cacœcia ? gallicolens*; the type of the latter description is a dwarfed and extremely dark specimen. Until I have examined really good examples of this species I should not like to hazard another guess at its affinities; but it certainly does not belong to the *Tortricidæ*.

Noctuites.

Declana floccosa of Walker should, I think, be placed among the Geometrites next to the genus *Ligia*; it is congeneric with the *Chlenias verrucosa* of Felder, which is not a true *Chlenias*. The form of the wings, slender abdomen, and long antennæ, seem to distinguish it from *Cnethocampa* and allies.

Leucaniidæ.

9. Leucania propria.

Leucania propria, Walker, Lep. Het. ix. p. 111.

In coll. Dr. Hector.

10. Leucania semivittata.

Leucania semivittata, Walker, Lep. Het. Suppl. ii. p. 628 (1865).

In colls. Dr. Hector and J. D. Enys, Esq.

11. Nonagria unica.

Leucania unica, Walker, Lep. Het. ix. p. 112 (1856).
Nonagria juncicolor, Guénée, Ent. Mo. Mag. v. p. 2 (1868).

♂. In colls. Dr. Hector and J. D. Enys, Esq.

After carefully comparing Guénée's description with Walker's type, and with the examples brought to England by Dr. Hector and Mr. Enys, I am perfectly satisfied that the two descriptions represent the same species. Walker's type, which is a female, has not the blackish-grey under surface to the primaries; nor have specimens obtained by Dr. Hector; but in two of Mr. Enys's examples this character is well marked. The dots on the primaries and the darker thorax, upon which M. Guénée lays some stress, are both characteristic of Walker's type, although less strongly indicated than in most individuals of the species.

Amphitape crassitibia of Felder is *Ipana leptomera* of Walker.

12. Alysia nullifera.

Agrotis nullifera, Walker, Lep. Het. xi. p. 742 (1857).
Alysia specifica, Guénée, Ent. Mo. Mag. v. p. 3 (1868).

In colls. Dr. Hector and J. D. Enys, Esq.

This species appears to me to approach most nearly to *Nonagria*.

APAMIDÆ.

13. HELIOPHOBUS DISJUNGENS.

Heliophobus disjungens, Walker, Lep. Het. xv. p. 1681 (1858).
Hadena nervata, Guénée, Ent. Mo. Mag. v. p. 40 (1868).

In colls. Dr. Hector and J. D. Enys, Esq.

The type is much rubbed; but a fresh example obtained by Dr. Hector seems to me to agree better with *Heliophobus* than with *Hadena*.

NOCTUIDÆ.

14. NITOCRIS COMMA.

Mamestra comma, Walker, Lep. Het. ix. p. 239 (1856).

In colls. Dr. Hector and J. D. Enys, Esq.

15. NITOCRIS PLUSIATA.

Hadena plusiata, Walker, Lep. Het. Suppl. iii. p. 742 (1865).
Nitocris bicomma, Guénée, Ent. Mo. Mag. v. p. 4 (1868).

In colls. Dr. Hector and J. D. Enys, Esq.

I have no doubt of the correct synonymy of this species.

16. AGROTIS SUFFUSA.

Noctua suffusa, Denis, Wien. Verz. p. 80. n. 4 (1775).

In colls. Dr. Hector and J. D. Enys, Esq.

17. AGROTIS ? MODERATA.

Agrotis ? moderata, Walker, Lep. Het. Suppl. ii. p. 705 (1865).

In colls. Dr. Hector and J. D. Enys, Esq.

18. AGROTIS CÆRULEA.

Agrotis (*Spælotis*) *cærulea*, Guénée, Ent. Mo. Mag. v. p. 38 (1868).

A fragment in coll. J. D. Enys, Esq.

19. AGROTIS MITIS, n. sp. (Plate XLII. fig. 5.)

Allied to *A. ashworthii*; primaries silvery grey, the usual spots and markings barely indicated by dark grey scales; a transverse, central, well-defined, elbowed, dark grey line from costa to inner margin; two ill-defined discal lines, the outer one most distinct and formed of small dark grey sagittate spots; a submarginal series of black dots bordered with dark grey externally; fringe with a broad but indistinct central grey band; costa spotted with blackish; secondaries pale shining greyish brown, with a dusky lunulate submarginal line; fringe whitish; thorax silvery grey, head rather dusky; collar with a slender posterior black marginal line; abdomen pale greyish brown: wings below shining greyish silver, primaries with the discoidal and interno-discoidal areas and the veins suffused with smoky brown, a submarginal series of small conical black spots, extreme margin yellowish, fringe greyish; secondaries with a well-

defined disco-cellular dark grey spot, a lunulated submarginal blackish line, extreme margin yellowish, fringe white; pectus and legs whitish; venter testaceous, clothed laterally and anally with grey hair. Expanse of wings 1 inch 4 lines.

South Island. Coll. J. D. Enys, Esq.

A very well-marked and pleasing species.

20. AGROTIS ADMIRATIONIS?

Agrotis admirationis, Guénée, Ent. Mo. Mag. v. p. 38 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

21. GRAPHIPHORA TARTAREA, n. sp. (Plate XLII. fig. 2.)

♂. Primaries shining purplish brown; outer border broadly bronzy, bounded within by a slender sinuated irregular submarginal pale line, which ends towards the costa in an oblique black litura; costa crossed, particularly in the centre, by black spots; two central pale lines, diverging towards costa (the inner one irregularly inarched, the outer one angulated and excavated), enclosing several transverse black spots, one of which indicates the hind margin of the reniform spot; the latter bounded externally by the outer transverse elbowed line, and followed immediately by a black spot; fringe with slender basal and central pale undulated lines; secondaries bronzy brown, fringe with slender basal pale line; head, collar, and shoulders grey; collar brown-edged; thorax reddish; abdomen smoky brown, anus testaceous; wings below shining grey, with a continuous blackish discal line; costal and external areas paler, irrorated with brown; fringe sordid ochraceous with slender basal pale line; body below grey, tarsi blackish; anal valves fringed with sandy yellow. Expanse of wings 1 inch 7 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

Allied to *G. rhomboidea*.

22. APAMEA VITIOSA, n. sp. (Plate XLII. fig. 3.)

Nearly allied to *A. oculea*; primaries purplish or red-brown, with the markings more or less defined; the renal stigma and the four transverse lines generally yellowish, the whole of the usual markings always indicated by blackish lines; outer margin crenated, black; fringe with a whitish basal crenated line; secondaries pale shining brown, outer margin crenulated, black; fringe with a whitish basal crenulated line: body corresponding with the wings in colour: wings below grey in dark examples, whitish, tinted with red, in pale examples, with the discal area of primaries and the veins grey; an irregular transverse blackish line, common to all the wings; a black spot on the disocellulars, and a marginal series of small blackish spots between the veins; body below purplish in dark varieties, reddish in pale varieties; tarsi above banded with black. Expanse of wings 1 inch 5 lines.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

This species has varieties parallel to those of the European *A. oculea*.

23. EUMICHTIS SISTENS.

Eumichtis sistens, Guénée, Ent. Mo. Mag. v. p. 39 (1868).

Coll. Dr. Hector.

HADENIDÆ.

24. HADENA MUTANS.

Hadena mutans, Walker, Lep. Het. xi. p. 602 (1857).

Coll. Dr. Hector.

25. HADENA LIGNIFUSCA.

Hadena lignifusca, Walker, Lep. Het. xi. p. 603 (1857).

Euplexia insignis (part), Walker, Lep. Het. Suppl. iii. p. 724 (1865).

Coll. Dr. Hector.

Possibly a variety of the preceding species.

26. HADENA DEBILIS, n. sp. (Plate XLII. fig. 6.)

Same general markings as in the two preceding; primaries silvery pale grey, crossed by a broad central (almost Y-shaped) pale brownish band, bounded by two brown lines, the outer line lunulated; the ordinary spots greyish, whitish-edged, between them a dark greyish area; a submarginal yellowish white lunulated line, relieved by blackish scales, and surrounded by a sandy-yellowish suffusion; a marginal series of blackish lunules; secondaries shining pale brown, with a marginal dusky line; thorax pale grey, collar and tegulæ with marginal black line; body whity-brown: wings below shining white; primaries with the discoidal and interno-discoidal areas greyish; secondaries irrorated with grey, a well-defined dark grey disco-cellular lunule; marginal markings as above; body below whitish. Expanse of wings 1 inch 5 lines.

North Island? Colls. Dr. Hector and J. D. Enys, Esq.

It is possible that this may be an extreme variation of *H. mutans*; but I think not; I have seen several examples all alike.

27. HADENA LIGNANA.

Hadena lignana, Walker, Lep. Het. xi. p. 758 (1857).

♀. Coll. Dr. Hector.

The type is a male.

28. HADENA INSIGNIS.

Euplexia insignis (part), Walker, Lep. Het. Suppl. iii. p. 724 (1865).

Xylina turbida, Walker, l. c. p. 754 (1865).

♂. Coll. J. D. Enys, Esq.

The *Xylina vexata* of Walker is closely allied to this species, but seems to be distinct.

METERANA, n. gen.

Allied to *Erana*, but with rather longer palpi, broader thorax, the abdomen with lateral and dorsal tufts of hair-scales, the antennæ of

the male not pectinated, but each article bearing short pencils of hair; the wings slightly broader, the median veins of primaries emitted more regularly, the discoidal cell of secondaries much longer, the subcostal and radial branches emitted from a very short footstalk, and the second and third median branches (without a footstalk) from the inferior extremity of the cell. Type *M. pictula*.

29. METERANA PICTULA. (Plate XLII. fig. 1.)

Dianthecia pictula, White, in Taylor's 'New Zealand and its Inhabitants,' pl. i. fig. 3 (1855).

Hadena pictula, Walker, Lep. Het. xi. p. 601 (1857).

North and South Islands. ♀. Coll. J. D. Enys, Esq.

The female has the primaries less strongly marked with yellow than the male, the renal stigma being also white; the secondaries are rose-pink, with the discocellular, three dots on the median branches, and a broad outer border dusky; a yellowish spot is discernible near the anal angle upon the border.

30. ERANA PLENA.

Erana plena, Walker, Lep. Het. Suppl. iii. p. 744 (1865).

Colls. Dr. Hector and J. D. Enys, Esq.

XYLINIDÆ.

31. AUCHMIS COMPOSITA.

Auchmis composita, Guénée, Gen. Lép. Noct. iii. p. 114 (1852).

Colls. Dr. Hector and J. D. Enys, Esq.

Felder has figured this species under the name of *Mamestra maori*.

32. XYLOCAMPA CUCULLINA?

Xylocampa cucullina, Guénée, Ent. Mo. Mag. v. p. 40 (1868).

Coll. J. D. Enys, Esq.

33. XYLOCAMPA INCEPTURA.

Xylina inceptura, Walker, Lep. Het. xv. p. 1736 (1858).

Xylina? deceptura, Walker, *l. c.* p. 1737 (1858).

Colls. Dr. Hector and J. D. Enys, Esq.

34. XYLINA USTISTRIGA.

Xylina ustistriga, Walker, Lep. Het. xi. p. 630 (1857).

Colls. Dr. Hector and J. D. Enys, Esq.

35. XYLINA LIGNISECTA?

Xylina lignisecta, Walker, Lep. Het. xi. p. 631 (1857).

Coll. Dr. Hector.

A single example in poor condition.

36. XYLOPHASIA STIPATA.

Xylina stipata, Walker, Lep. Het. Suppl. iii. p. 753 (1865).

Colls. Dr. Hector and J. D. Enys, Esq.

This species certainly belongs to the genus *Xylophasia*.
Xylina provida and *X. canescens* of Walker are synonyms.

Amphipyridæ.

37. Bityla atristriga.

Xylina atristriga, Walker, Lep. Het. Suppl. iii. p. 756 (1865).
♀. Coll. Dr. Hector. ♂. Coll. J. D. Enys, Esq.

38. Bityla defigurata.

Xylina defigurata, Walker, Lep. Het. Suppl. iii. p. 756 (1865).
Bityla thoracica, Walker, *l. c.* p. 869 (1865).
Coll. J. D. Enys, Esq.

39. Bityla sericea, n. sp. (Plate XLII. fig. 12.)

Primaries shining greyish brown, crossed by two widely separated and slightly diverging dusky lines, the inner one in the shape of a }, the outer one composed of small lunules with whitish exterior margins; outer margin undulated, fringe silky whitish; secondaries pale brown, fringe sandy whitish; thorax greyish brown, collar slightly darker; abdomen ?: primaries below pale grey, costa and fringe whitish; secondaries whitish, with a submarginal indistinct grey band, and the outer border of the same tint, fringe whitish; pectus sandy yellowish, dusky in front; legs sandy yellowish, banded with black. Expanse of wings 1 inch 6 lines.

South Island. Coll. J. D. Enys, Esq.
One imperfect example. It is allied to *B. defigurata*.

Heliothidæ.

40. Heliothis conferta.

Heliothis conferta, Walker, Lep. Het. xi. p. 690. n. 21 (1857).
Coll. Dr. Hector.

Euclidiidæ.

41. Euclidia hectori, n. sp. (Plate XLII. fig. 4.)

Primaries very like those of the New-Zealand *Fidoniæ*, shining grey, irrorated with white, with a central irregular broad band, edged on each side with dark brown; a broad brown outer border, through the centre of which runs a pale lunulated line; costa crossed by oblique brown dashes; fringe brown, spotted externally with white; secondaries with the basal two thirds whity-brown, crossed by three nearly straight parallel brown bands; apical third brown, crossed by a slender irregularly undulated whity-brown line; fringe brown, tipped with white; body grey: wings below sordid white, with a broad black outer border, crossed by a sinuous macular white streak; primaries with a transverse dash near the base, and three bands (the outermost elbowed) across the central area, black; secondaries greyish at base, crossed by four parallel black bands; body below sandy whitish. Expanse of wings 1 inch 5 lines.

High-mountain form. Colls. Dr. Hector and J. D. Enys, Esq.
Found at between 4000 and 5000 feet. Very difficult to catch.

Pyralites.

Hypenidæ.

42. Rhapsa scotosialis.

Rhapsa scotosialis, Walker, Lep. Het. Suppl. iv. p. 1150 (1865).

Colls. Dr. Hector and J. D. Enys, Esq.

Herminiidæ.

43. Herminia lilacina, n. sp. (Plate XLII. fig. 11.)

Primaries olive-brown, shot with lilac and irrorated with black, a minute annular marking at the base; a transverse discal series of dots, and a submarginal undulated line, black; a rounded orange black-edged spot in the centre of the cell; the spot on the disco-cellulars ("reniform" of Guénée) B-shaped, orange, black-edged; secondaries sandy whitish; external area and a well-defined transverse discal line dusky; margins of all the wings with a slender brown line dotted with black, the fringe grey, with a basal yellow line; body corresponding in colour with the wings: primaries below grey, the costal and external areas pale testaceous; secondaries whitish testaceous, irrorated with brown; all the wings with a discal transverse streak, and a submarginal series of spots brown; fringe as above. Expanse of wings 1 inch 7 lines.

South Island. Coll. Dr. Hector.

44. Daraba paronalis.

Scopula? paronalis, Walker, Lep. Het. xviii. p. 797 (1859).

Colls. Dr. Hector and J. D. Enys, Esq.

45. Scopula flavidalis.

Margaritia flavidalis, Doubleday, Dieff. N. Zeal. App. p. 288 (1843).

Colls. Dr. Hector and J. D. Enys, Esq.

S. quadralis and *S. dipsasalis* appear to be varieties of this species, they agree with it in marking. *Botys otagalis* of Felder seems to be an allied but distinct species.

46. Mecyna ornithopteralis.

Mecyna ornithopteralis, Guénée, Sp. Gen. Lép., Delt. et Pyral. p. 411 (1854).

Colls. Dr. Hector and J. D. Enys, Esq.

A very variable species; the *Botys maorialis* of Felder may be a form of it; it is certainly congeneric.

Scopariidæ.

47. Scoparia diptheralis.

Scoparia diptheralis, Walker, Lep. Het. Suppl. iv. p. 1503 (1865).

South Island. Coll. J. D. Enys, Esq.

48. SCOPARIA SUBMARGINALIS.

Hypochalcia submarginalis, Walker, Lep. Het. xxvii. p. 48 (1863).
Scoparia feredayi, Knaggs, Ent. Mo. Mag. iv. p. 80 (1867).

Colls. Dr. Hector and J. D. Enys, Esq.

49. SCOPARIA RAKAIENSIS.

Scoparia rakaiensis, Knaggs, Ent. Mo. Mag. iv. p. 80 (1867).

South Island. Coll. J. D. Enys, Esq.

The *Scoparia ejuncida* of Knaggs is *Hypochalcia indistinctalis* of Walker.

GEOMETRITES.

ENNOMIDÆ.

50. POLYGONIA FORTINATA.

Polygonia fortinata, Guénée, Ent. Mo. Mag. v. p. 41 (1868).
Caustoloma? ziczac, Felder, Reise der Nov. Lep. v. pl. cxxxii. 4.

North and South Islands. Coll. J. D. Enys, Esq.

The *Selenia gallaria* of Walker is a nearly allied species of the same genus.

51. GONODONTIS FELIX, n. sp. (Plate XLII. fig. 10.)

Primaries golden fawn-colour, sparsely irrorated with grey, crossed near the base by a zigzag line which runs inwards at the costa, and beyond the middle of the wing by a nearly straight oblique line, both purplish brown; the outer line bordered externally by a slender line of pinky whitish; a black spot at the end of the cell; fringe orange, white-tipped; secondaries pale pinky brownish; the disk crossed by an irregular grey line; a grey spot at the end of the cell; fringe orange, tipped with white; head and thorax golden fawn-colour: wings below pale reddish clay-colour; outer border paler, with zigzag internal edge; a discal black-dotted transverse line, zigzag on the secondaries; a black spot at the end of each discoidal cell; costa of primaries dotted alternately with ferruginous and white; pectus reddish clay-colour. Expanse of wings 1 inch 10 lines.

South Island. Coll. J. D. Enys, Esq.

Allied to *G. nelsonaria* of Felder. Dr. Staudinger possesses a smaller and less strongly marked example of the same species, probably its male; in this specimen the pale external border is wanting on the under surface. "It varies much in depth of colour" (*Enys*).

52. SESTRA OBTRUNCATA.

Cidaria? obtruncata, Walker, Lep. Het. xxv. p. 1421 (1862).
Teras punctilineana, Walker, *l. c.* Suppl. v. p. 1780 (1866).

Coll. J. D. Enys, Esq.

Judging from an example in Dr. Staudinger's possession, I suspect that this is only a variety of *Sestra flexata*, described by Walker as a *Cidaria*, but identical with his *S. fusiplagiata*.

53. SESTRA OBTUSARIA.

Lozogramma obtusaria, Walker, Lep. Het. xxiii. p. 985 (1861).

Coll. J. D. Enys, Esq.

This is closely allied to (if not identical with) *S. humeraria* of Walker, described with a query as a *Macaria*. The genus *Sestra* seems to be most nearly allied to *Epione*.

BOARMIIDÆ.

54. BOARMIA DEJECTARIA.

Boarmia dejectaria, Walker, Lep. Het. xxi. p. 394 (1860).
Boarmia exprompta, Walker, *l. c.* p. 395 (1860).
Trephrosia patularia, Walker, *l. c.* p. 422 (1860).
Gnophos pannularia, Guénée, Ent. Mo. Mag. v. p. 42 (1868).
Scotopteryx maoriata, Felder, Reise der Nov. Lep. v. pl. cxxvi. fig. 4.
Hemerophila sulpitiata, Felder, *l. c.* fig. 7.
H. caprimulgata, Felder, *l. c.* fig. 12.

Colls. Dr. Hector and J. D. Enys, Esq.

Boarmia dejectaria is one of the commonest and most variable of the New-Zealand moths; there is therefore some excuse for the multiplication of specific names associated with it; but the positions assigned to these supposed species show deplorable carelessness as to structural characters.

55. BOARMIA ATTRACTA.

Boarmia attracta, Walker, Lep. Het. xxi. p. 394 (1860).

North Island. Coll. J. D. Enys.

As I have shown in my 'Lepidoptera of New Zealand,' Mr. Walker described this form three times under two different genera. I strongly suspect it to be an extreme variety of the preceding species. The *Tephrosia scriptaria* of Walker is identical with his *Scotosia stigmaticata*.

ACIDALIIDÆ.

56. ASTHENA SUBPURPUREATA.

Asthena subpurpureata, Walker, Lep. Het. xxvi. p. 1588 (1862).
Acidalia tuhuata, Felder, Reise der Nov. Lep. v. pl. cxxviii. f. 5.

Colls. Dr. Hector and J. D. Enys, Esq.

57. ASTHENA PULCHRARIA.

Acidalia pulchraria, Doubleday, Dieff. N. Zeal. App. p. 286 (1843).
Asthena mullata, Guénée, Ent. Mo. Mag. v. p. 42 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

58. ACIDALIA RUBRARIA.

Acidalia? rubraria, Doubleday, Dieff. N. Zeal. App. p. 286 (1843).
Fidonia? acidaliaria, Walker, Lep. Het. xxiv. p. 1037 (1862).

Colls. Dr. Hector and J. D. Enys, Esq.

59. ACIDALIA SCHISTARIA.

Acidalia schistaria, Walker, Lep. Het. xxiv. p. 782 (1861).
Coll. Dr. Hector.

60. ACIDALIA UNDOSATA.

Cidaria undosata, Felder, Reise der Nov. Lep. v. pl. cxxviii. fig. 2.
Colls. Dr. Hector and J. D. Enys, Esq.

61. ACIDALIA PRÆFECTATA.

Acidalia præfectata, Walker, Lep. Het. xxiv. p. 781 (1861).
Acidalia subtentaria, Walker, *l. c.* xxvi. p. 1610 (1862).
Acidalia absconditaria, Walker, *l. c.* p. 1611 (1862).
Colls. Dr. Hector and J. D. Enys, Esq.
Now that I have placed the types of Walker's three descriptions in one drawer, I find them to be slight variations of one and the same species.

FIDONIDÆ.

62. PANAGRA SCISSARIA.

Panagra scissaria, Guénée, Ent. Mo. Mag. v. p. 43 (1868).
Coll. J. D. Enys, Esq.
This species bears a strong general resemblance to Walker's genus *Samana*; the latter should, perhaps, be placed near it. *Panagra ephyraria* is congeneric with *Gargaphia muriferata*. I discovered that Walker had placed the two together, but without moving the label of the former from its original position. It seems to have been a common practice with this naturalist, when he supposed two of his species to be identical, to put the specimens under one name, leaving the labels undisturbed. This practice has given me inconceivable trouble, and has wasted much valuable time.

63. FIDONIA BREPHOSATA.

Fidonia? brephosata, Walker, Lep. Het. xxiv. p. 1037 (1862).
Coll. J. D. Enys, Esq.

64. FIDONIA CATOCALARIA.

Larentia catocalaria, Guénée, Ent. Mo. Mag. v. p. 26 (1868).
Colls. Dr. Hector and J. D. Enys, Esq.
I believe this to be a slight variety of the preceding species, and to be identical with *Fidonia brephos* of Felder.

65. FIDONIA ENYSII, n. sp. (Plate XLII. fig. 9.)

Primaries above pale grey, crossed by sandy yellowish, white, and dark grey bars and lines, some of which form an irregular darker central band; outer border broadly dark grey, bounded internally by a lunulated sandy stripe and intersected by a pale line; fringe alternately pale brown and whitish; secondaries bright orange; abdominal area speckled with blackish; a subbasal transverse black

line; outer border dentated, black; fringe alternately brown and whitish; body grey: wings below bright ochreous, crossed by several black lines, much as in the preceding species; outer border black, intersected by a crenated yellow stripe, which in the secondaries unites with the ground-colour at the apex and in the second median interspace; pectus white, venter creamy whitish. Expanse of wings 1 inch 4 lines.

Three examples. Coll. J. D. Enys, Esq.

A mountain form, found at from 3000 to 5000 feet.

66. FIDONIA ANCEPS, n. sp. (Plate XLIII. fig. 3.)

Allied to the preceding species, but paler; the secondaries above straw-yellow, dusky at the base, crossed by three parallel central dark grey bands; also with a confused zigzag submarginal band of the same colour. Expanse of wings 1 inch 3 lines.

Two examples. Coll. J. D. Enys, Esq.

Also a mountain species.

67. FIDONIA FEROX, n. sp. (Plate XLII. fig. 8.)

Primaries dark shining grey, crossed by numerous darker undulated and lunular lines; two of these form a central band, relieved on each side by a tint of bronzy brown; outer border broadly tinted with bronzy brown, and bounded within by a double lunulated line; fringe long and grey; secondaries fiery orange, greyish at base, crossed from the basal third by five black lines, the first and last thickest, the first two straight, the two next lunulated and angulated, the fifth lunulated and arched, submarginal; margin black; fringe long and brown, grey at the tips; body greyish brown, abdomen annulated with whitish: wings below golden orange; external half crossed by lunulated black and silvery white lines; body below white. Expanse of wings 1 inch 2 lines.

Coll. J. D. Enys, Esq.

The prettiest of all the orange-winged species. Found at from 3000 to 5000 feet elevation.

68. FIDONIA? ABROGATA.

Aspilates abrogata, Walker, Lep. Het. xxiv. p. 1075 (1862).
Fidonia? servularia, Guénée, Ent. Mo. Mag. v. p. 43 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

I believe this to be a species of *Acidalia*; it certainly has very little in common with *Fidonia*, and does not at all agree with *Aspilates*.

69. FIDONIA? CATAPYRRHA, n. sp. (Plate XLIII. fig. 2.)

♂, ♀. Primaries above whitish, clouded and banded with brown; the principal markings are an angulated transverse subbasal dark brown band; two central bands forming a band, its inner edge subangulated, its outer edge very irregular, projecting within the median interspaces; an interrupted submarginal brown streak; a brown apical spot, and five oval marginal red spots enclosing black

dots at their interior extremities; fringe alternately brown and white; secondaries ochre-yellow, with a central angulated bifid band, an angulated submarginal streak, and the outer border composed of dark grey scales; a marginal series of black dots; fringe grey; body brown; abdomen banded with white: primaries below stramineous; an angulated postmedian band, bifid above the median nervure, a dot at end of cell, an irregular transverse tapering subapical streak, and the centre of the outer border black-brown; a subapical spot, and the apical border pale ferruginous; a spot on the costa, and an irregular apical submarginal streak, white; fringe alternately brown and white; secondaries brick-red; a central longitudinal cuneiform streak proceeding from the base to near the outer margin, and the abdominal border, white; a spot close to the base, a central angulated transverse band, a claviform submarginal streak, and a spot on the outer margin, black; fringe grey; body below whitish. Expanse of wings 8½ lines.

Colls. Dr. Hector and J. D. Enys, Esq.

70. ASPILATES INSIGNIS, n. sp. (Plate XLIII. fig. 1.)

♂. Primaries cupreous-brown, the base, costal area, and centre of internal area irrorated with grey; a submedian longitudinal streak from base of inner margin to just beyond the end of discoidal cell, and a transverse straight discal band, white; fringe pale grey; secondaries sandy yellow, the base and outer border finely dusted with pale grey; fringe whitish; body grey; anal tuft testaceous: wings below sandy yellow, fringe whity-brown, white internally; pectus whitish, venter testaceous. Expanse of wings 1 inch 4 lines.

3000 to 4000 feet elevation. Colls. Dr. Hector and J. D. Enys, Esq.

In one example obtained by Mr. Enys the longitudinal white streak of primaries joins the discal white band, and the coloration is altogether deeper than in the type. Mr. Enys took one specimen at 6000 feet.

71. DASYURIS PERORNATA.

Fidonia perornata, Walker, Lep. Het. xxvi. p. 1672 (1862).

Coll. J. D. Enys, Esq.

72. DASYURIS PARTHENIATA.

Dasyuris partheniata, Guénée, Ent. Mo. Mag. v. p. 93 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

Allied to *Camptogramma correlata* of Walker.

73. DASYURIS REHATA.

Cidaria rehata, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 6.

Coll. Dr. Hector.

This species varies much in the outline of the central band of primaries. I have not seen it with the falcate form of wing represented in Felder's figure.

HYBERNIIDÆ.

74. HYBERNIA INDOCILISARIA.

Zermizinga indocilisaria, Walker, Lep. Het. xxvi. p. 1530 (1862).
Hybernia boreophilaria, Guénée, Ent. Mo. Mag. v. p. 61 (1868).
♂, ♀. Coll. Dr. Hector.

LARENTIIDÆ.

75. LARENTIA PRODUCTATA.

Larentia productata, Walker, Lep. Het. xxiv. p. 1197 (1862).
Coll. J. D. Enys, Esq.
Larentia quadristrigata is synonymous with *L. interclusa*.

76. LARENTIA SEMISIGNATA.

Larentia semisignata, Walker, Lep. Het. xxiv. p. 1200 (1862).
Cidaria dissociata, Walker, Lep. Het. xxvi. p. 1734 (1862).
Cidaria semilisata, Walker, *l. c.* p. 1735 (1862).
Larentia corcularia, Guénée, Ent. Mo. Mag. v. p. 61 (1868).
Colls. Dr. Hector and J. D. Enys, Esq.

I here insert two puzzling genera:—

PSEUDOCOREMIA, n. gen.

Aspect of *Larentia productata*; antennæ as in *Boarmia*. Palpi short, projecting a short distance in front of the eyes. Posterior margins of the segments of abdomen more or less tufted laterally. Wings broad; primaries rounded at apex; discocellulars transverse, regular; first median branch emitted at some distance from the second and third, the latter emitted close together at the end of the cell. Discocellular of secondaries angulated; second and third median branches emitted nearer together than the first and second. Type *P. fragosata*.

This genus is probably allied to *Boarmia*, but has the general coloration of *Larentia productata*, and the abdomen very long—according to Mr. Enys, sometimes as long as that of *Tatosoma*.

77. PSEUDOCOREMIA FRAGOSATA.

Selidosema? fragosata, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 29.

South Island. Coll. J. D. Enys, Esq.
Selidosema of Hübner agrees with *Tephrosia*.

78. PSEUDOCOREMIA INDISTINCTA, n. sp. (Plate XLIII. fig. 8.)

Primaries whitish, tinted with stramineous and mottled with brown; base spotted with dark brown; an angulated squamose brown fascia limiting the basal area; the costal area beyond the middle banded with brown; a submarginal series of large spots and the outer border brown; two series of short longitudinal black lituræ on the latter between the veins; secondaries stramineous, with indications of two squamose ferruginous bands, one across the

cell, the other submarginal; a marginal series of minute black dots; thorax pale brown; head dark brown; abdomen stramineous: underside stramineous; primaries with the discoidal cell, base, and a squamose apical patch brown. Expanse of wings 1 inch 3 lines.

South Island. Coll. Dr. Hector.

CACOPSODOS, n. gen.

Agreeing in general appearance and in its hairy palpi with *Psodos*, but differing entirely in the structure of the antennæ, the latter presenting to the naked eye the appearance of those of *Coremia* ♀, but having in reality only the inner margin pectinated, the outer margin being quite simple. Type *C. niger*.

79. CACOPSODOS NIGER, n. sp. (Plate XLIII. fig. 4.)

Greyish black, speckled with white scales; primaries crossed by a broad dentated central black band; below shining dark grey, with a continuous paler discal line; pectus black. Expanse of wings 11 lines.

South Island. Coll. J. D. Enys, Esq.

This species is somewhat like *Panagra explanata*, *disputata*, and *exsignata*, but differs in its hairy palpi.

80. HELASTIA INVEXATA.

Larentia invexata, Walker, Lep. Het. xxiv. p. 1199 (1862).

Cidaria adonata?, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 31.

Colls. Dr. Hector and J. D. Enys, Esq.

81. HELASTIA INDICATARIA.

Eupithecia indicataria, Walker, Lep. Het. xxvi. p. 1708 (1862).

Coll. Dr. Hector.

82. HELASTIA BILINEOLATA.

Eupithecia bilineolata, Walker, Lep. Het. xxiv. p. 1246 (1862).

Eupithecia cidariaria?, Guénée, Ent. Mo. Mag. v. p. 62 (1868).

Coll. J. D. Enys, Esq.

Possibly an extreme form of the preceding species. The three here placed under *Helastia* differ from the males of *Eupithecia* in their prominently pectinated antennæ; the following also seems to agree with them in structure:—

83. HELASTIA MUSCOSATA.

Eupithecia? *muscosata*, Walker, Lep. Het. xxiv. p. 1246 (1862).

Colls. Dr. Hector and J. D. Enys, Esq.

I think it not improbable that the *Coremia inamœnaria* of Guénée is this species; but the description is not sufficiently precise to enable me to determine it satisfactorily. Felder's figure of *Cidaria aquosata* may also be intended for this species.

84. COREMIA ROSEARIA.

Cidaria rosearia, Doubleday, Dieff. N. Zeal. App. p. 285 (1843).
Coremia pastinaria, Guénée, Ent. Mo. Mag. v. p. 64 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

As I do not possess Guénée's type (of *C. subidaria*) from Australia to compare with Doubleday's from New Zealand, I cannot be absolutely certain that they are identical, although they have long been considered so. M. Guénée says, "Elle varie extrêmement," which is the case with Doubleday's species; the latter also comes both from Australia and New Zealand.

85. COREMIA ARDULARIA.

Coremia ardularia, Guénée, Ent. Mo. Mag. v. p. 63 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

86. CAMPTOGRAMMA SUBOCHRARIA.

Aspilates? *subochraria*, Doubleday, Dieff. N. Zeal. App. p. 285 (1843).

Var. *Camptogramma fuscinata*, Guénée, Ent. Mo. Mag. v. p. 92 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

The brown form named by Guénée is a common and slight variety of the species, not differing in any thing but tint and varying in intensity.

87. CAMPTOGRAMMA STINARIA.

Camptogramma stinaria, Guénée, Ent. Mo. Mag. v. p. 92 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

A well-marked and pretty little species.

88. PHIBALAPTERYX GOBIATA.

Cidaria (*Phibalapteryx*) *gobiata*, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 2.

Colls. Dr. Hector and J. D. Enys, Esq.

89. PHIBALAPTERYX VERRICULATA.

Cidaria verriculata, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 20.

On cabbage-trees near the sea. Colls. Dr. Hector and J. D. Enys, Esq.

Phibalapteryx parvulata of Walker is identical with *Scotosia denotata*; and *Scotosia humeraria* is probably a worn example of the same. *Scotosia panagrata* is a *Hyperythra*. It varies in so remarkable a manner that, had I not seen intermediates between the extreme forms, it would have been impossible to associate them together. The type is brown, the primaries rather darker than the secondaries, showing traces of darker transverse lines, and having a 3-shaped white line on the discocellulars; the extreme variation has no white line, but both primaries and secondaries are spotted with bright ochraceous as follows:—primaries with a short subbasal

transverse macular fascia, a similar abbreviated subapical fascia, and and a spot on inner margin near external angle; secondaries with a transverse subapical abbreviated fascia and a spot at anal angle. The genus *Hyperythra* belongs to the Ennomidæ.

90. CIDARIA CLARATA.

Larentia clarata, Walker, Lep. Het. xxiv. p. 1197 (1862).
Cidaria pyramaria, Guénée, Ent. Mo. Mag. v. p. 93 (1868).
Colls. Dr. Hector and J. D. Enys, Esq.

91. CIDARIA BEATA, n. sp. (Plate XLIII. fig. 6.)

Above very similar in pattern to the preceding species, but much smaller, and the primaries with all the markings olive-green instead of bronzy brown; the secondaries white instead of yellow, with a pale pinky brown outer border; thorax olive-green; abdomen testaceous: primaries below with the basal area, to the extremity of the dentated central band of the upper surface, madder-brown; costa testaceous, tinted with olivaceous, and crossed by ferruginous bars; disk whity-brown; apex and outer border shining testaceous, almost golden; a submarginal series of white dots; fringe silvery white, black-spotted; secondaries pale testaceous, increasing in intensity to the outer border, which is golden, crossed by paralled crenate olivaceous lines, three of which form a central band, relieved externally by white lunules; disk crossed by paler olivaceous lines, followed by a submarginal series of white lunules; body below testaceous. Expanse of wings 1 inch.

South Island. Coll. J. D. Enys, Esq.
A very distinct and pretty little species.

92. CIDARIA SEMIFISSATA.

Coremia semifissata, Walker, Lep. Het. xxv. p. 1320 (1862).
Cidaria delicatulata, Guénée, Ent. Mo. Mag. v. p. 94 (1868).
Colls. Dr. Hector and J. D. Enys, Esq.

M. Guénée's description of *Coremia ypsilonaria* would almost do for some examples of this species; but he can hardly have described it twice under distinct genera.

93. CIDARIA SIMILATA.

Cidaria similata, Walker, Lep. Het. xxv. p. 1413 (1862).
Colls. Dr. Hector and J. D. Enys, Esq.

94. CIDARIA MEGASPILATA.

Larentia megaspilata, Walker, Lep. Het. xxiv. p. 1198 (1862).
Cidaria assata, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 4.
Colls. Dr. Hector and J. D. Enys, Esq.

95. CIDARIA CONGREGATA.

Cidaria congregata, Walker, Lep. Het. xxv. p. 1415 (1862).
Cidaria monoliata, Felder, Reise der Nov. Lep. v. pl. cxxxii. fig. 8.
Coll. Dr. Hector.

96. CIDARIA INCLARATA.

Cidaria inclarata, Walker, Lep. Het. xxv. p. 1411 (1862).

Colls. Dr. Hector and J. D. Enys, Esq.

97. CIDARIA PLAGIFURCATA.

Cidaria plagifurcata, Walker, Lep. Het. xxv. p. 1416 (1862).

Coll. Dr. Hector.

Cidaria inopiata of Felder appears to be a slight variety of *C. perductata* of Walker; and *C. timarata* is a poor figure of *C. similata*.

98. TATOSOMA LESTEVATA.

Cidaria lestevata, Walker, Lep. Het. xxv. p. 1416 (1862).

Sauris ranata, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 11.

Coll. J. D. Enys, Esq.

99. ELVIA GLAUCATA.

Elvia glaucata, Walker, Lep. Het. xxv. p. 1431 (1862).

Coll. J. D. Enys, Esq.

Felder's figures of this species are too brightly coloured.

LIGIDÆ.

100. DECLANA FLOCCOSA.

Declana floccosa, Walker, Lep. Het. xv. p. 1649 (1858).

Colls. Dr. Hector and J. D. Enys, Esq.

Walker's *Argua scabra* is an allied species, if not a variety.

101. DECLANA FEREDAYI, n. sp. (Plate XLIII. fig. 5.)

Primaries shining pinky grey, crossed by innumerable short black lines; two widely separated irregularly zigzag central black lines, indicating a broad central band, which is relieved on each side by ferruginous; external area (commencing in an oblique line from the apex) silvery; a regularly zigzag marginal line; fringe greyish brown; secondaries pale grey; margin and fringe as in primaries; thorax dark grey, varied with ferruginous; abdomen pale grey: wings and body below pale grey; primaries with the costa whitish, spotted with dark grey; fringe and margin as above. Expanse of wings 1 inch 6 lines.

Christchurch. Coll. J. D. Enys, Esq.

A common species round Christchurch.

CRAMBITES.

GALLERIDÆ.

102. APHOMIA STRIGOSA, n. sp. (Plate XLIII. fig. 10.)

Primaries shining whity-brown; crossed beyond the middle by an arched deeply dentated slender black line, bounded externally by whitish; a white submedian streak, from the base to the origin of the first median branch, bounded below and at its extremity by a

hooked black streak; a whitish ill-defined streak through the end of the cell, upon which there is a minute black discocellular dot; secondaries pale whity-brown, slightly darker at the apex; body coloured like the opposite wings, anal tuft yellow: wings below shining pale whity-brown, sandy yellowish on the costal areas; body below whitish. Expanse of wings 1 inch 3 lines.

South Island. Coll. Dr. Hector.

Were it not for the black and white longitudinal streaks below the discoidal cell of primaries, this species would not be at all unlike the European form. It is common in grass.

Phycidæ.

103. Hypochalcia corrupta, n. sp. (Plate XLIII. fig. 9.)

Pale brown; primaries with the costal half irrorated with whitish; base, centre of disk, and two terminal patches (the smaller one nearest to apex) bronzy, speckled with black; fringe of all the wings pale grey, very long; thorax brown, abdomen paler brown: wings below whity-brown, the primaries rather darker than the secondaries; fringe silky-whitish; body below whitish. Expanse of wings 9 lines.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

Common in grass.

104. Gadira acerella.

Gadira acerella, Walker, Lep. Het. Suppl. v. p. 1742 (1866).

Botys mahanga, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 27.

Colls. Dr. Hector and J. D. Enys, Esq.

Not common.

Crambidæ.

105. Crambus flexuosellus.

Crambus flexuosellus, Doubleday, Dieff. N. Zeal. App. p. 289 (1843); Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 32.

Coll. Dr. Hector.

The commonest *Crambus* in New Zealand.

106. Crambus vapidus, n. sp.

Primaries above testaceous, with a longitudinal whitish streak tapering to both ends, from the base through the discoidal cell to the outer margin, bounded towards the base below and in the centre above by blackish lines; apical margin whitish: four black dots terminating the nervures at the centre of outer margin; fringe shining whitish; secondaries shining whitish; head and thorax white; palpi externally, and tegulæ, pale pinky brown; abdomen testaceous: wings below paler than above; primaries without markings; body below whitish. Expanse of wings 11 lines.

South Island. Coll. Dr. Hector.

107. CRAMBUS TRANSCISSALIS.

Crambus transcissalis, Walker, Lep. Het. xxvii. p. 178 (1863).

Coll. Dr. Hector.

This species appears to be rare; I have only seen two examples.

108. CRAMBUS RAMOSELLUS.

Crambus ramosellus, Doubleday, Dieff. N. Zeal. App. p. 288 (1843).

Var.? *Crambus rangona*, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 25.

Coll. J. D. Enys, Esq.

Walker confounded with this species two New-Zealand examples of the Australian *Crambus lativittalis*.

109. CRAMBUS TRIVIRGATUS.

Crambus trivirgatus, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 29.

South Island. Coll. J. D. Enys, Esq.

Apparently a rare species.

110. CRAMBUS VULGARIS, n. sp. (Plate XLIII. fig. 7.)

Primaries above pale reddish brown, more or less irrorated with whitish on the costal area; a longitudinal discoidal white streak from the base, upon which are two dark brown spots, the inner one smaller and squamose, the outer one cuneiform and sharply defined; a white subapical dentated abbreviated transverse band sometimes joining and always approaching at its extremity an oblique streak, which proceeds from the apex; the inner edge of the subapical band sometimes outlined in black; five black dots on the outer margin; fringe reddish brown externally, white internally, with a central blackish line; secondaries stramineous, sometimes tinted with reddish; fringe white; body reddish brown, the thorax darker than the abdomen: wings below stramineous; the costal area of primaries brownish; body below whitish. Expanse of wings 1 inch.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

Evidently a common species, allied to *C. tuhualis* of Felder, but said to be local.

111. CHILO SIMPLEX, n. sp. (Plate XLIII. fig. 12.)

Primaries above silky testaceous, the costa and fringe silvery whitish; a central longitudinal silvery white streak from base to centre of outer margin, this band is bounded on each side by deep longitudinal folds, which in certain lights look like black lines; secondaries white, slightly tinted with buff towards the outer margin; head and greater part of thorax testaceous, metathorax white; abdomen whitish: wings below pale silky testaceous, the primaries darker than the secondaries; pectus testaceous, venter white. Expanse of wings 1 inch 3 lines.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

I have taken the description from an example previously in the

Museum collection from Auckland, and which Walker had confounded with *Crambus vitellus* of Doubleday.

112. CHILO LEUCANIALIS, n. sp.

Primaries above silky testaceous, the internal area from the median vein downwards more or less suffused with pale bronze-brown, which is deepest immediately below the median vein; a longitudinal white streak above the median vein; the veins beyond the discoidal cell bronze-brown, their interspaces whitish; secondaries silvery white, slightly testaceous towards outer margin; body creamy white; tegulæ and upper surface of two anterior pairs of legs brown: primaries below testaceous; secondaries white, with a faint yellowish tint; body below white. Expanse of wings 1 inch 1 line.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

The colouring is not unlike that of *Leucania*.

113. EROMENE AURISCRIPTELLA.

Eromene auriscriptella, Walker, Lep. Het. xxx. p. 976 (1864).

Crambus gracilis, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 26.

Coll. Dr. Hector.

114. EROMENE METALLIFERA, n. sp. (Plate XLIII. fig. 11.)

Allied to the preceding species, but differing as follows:—Primaries rather brighter in colour, the central transverse lines only half as wide apart; the silver discocellular spot less curved, and edged with brown; a series of longitudinal discal silver lines between the veins; secondaries white instead of brown. Expanse of wings 8 lines.

Coll. Dr. Hector.

This is a very beautiful little species.

115. SAMANA ACUTATA, n. sp.

Primaries pale straw yellow; an oblique interno-basal litura, a dot at the end of the cell, and a discal transverse line terminating in an acute <-shaped angle, piceous; the discal line diffused externally; a marginal series of black dots; secondaries white, with the fringe creamy; a marginal series of black dots; thorax pale straw yellow, abdomen white: primaries below pale testaceous, whitish on internal area; markings (excepting the marginal dots, which are united by a slender brown line) only visible through the wing; secondaries white, the costal area tinted with testaceous, and sparsely irrorated with brown; a small black dot at the end of cell; a marginal series of black dots; fringe creamy: body below pale straw yellow. Expanse of wings 1 inch 2 lines.

Sea-level, South Island. Coll. J. D. Enys, Esq.

In my opinion, this genus would be better placed amongst the *Pyrales*.

116. ADENA XANTHIALIS.

Adena xanthialis, Walker, Lep. Het. xxvii. p. 168 (1863).

Coll. J. D. Enys, Esq.

This genus certainly has no business among the *Crambites*; it should be placed among the *Hypenidæ*.

TORTRICITES.

TORTRICIDÆ.

117. TERAS ÆNEA, n. sp.

Primaries with the central area brassy, gradually merging into cupreous towards the borders, which are silky brown; secondaries brown, subcostal area yellowish, costal area pale stramineous; body above dark brown: wings below shining brassy yellow, the primaries becoming greyish brown at the borders, the secondaries becoming golden towards the outer margin; body below creamy whitish. Expanse of wings 1 inch.

Mountain form. Coll. J. D. Enys, Esq.

Found at 3000 to 4000 feet elevation.

118. TERAS FLAVESCENS, n. sp.

Primaries straw-yellow, very indistinctly reticulated with deeper lines of the same colour; a spot at the extremity of the costal nervure, a second less distinct at the end of the second subcostal branch, and the apical half of the fringe, tawny; secondaries white, tinted with stramineous towards costa; thorax ochraceous; abdomen (probably white): primaries below whitish, with the basi-costal area and apex ochraceous, crossed by orange reticulations; apical fringe tawny; secondaries pale stramineous, reticulated with orange; pectus silvery white, legs ochraceous. Expanse of wings 1 inch 4 lines.

South Island. Coll. Dr. Hector.

This species seems to me to belong to the *T. boscana* group.

Several genera are confounded by Walker under *Teras*; his *T. oblongana* and *T. inaptana* are probably also variations of one species; and I believe his *T. servana*, *T. priscana*, and *T. contractana* to be synonymous; but the specimens are in poor condition, which renders their accurate determination difficult.

119. CACOËCIA VILIS, n. sp. (Plate XLIII. fig. 15.)

Allied to *C. herana* of Felder. Primaries above shining sordid testaceous; subbasal area, base of inner margin, and external border silvery grey; a **V**-shaped basi-subcostal marking, an oblique bracket-shaped line from the cell to the inner margin, and two or three dots near the outer margin black-brown; a semicircular costal brown patch, a diffused brownish patch bounded within by the bracket-shaped line; secondaries white, the apical and abdominal areas feebly tinted with testaceous; head white, thorax brown: primaries below reddish, markings indistinct; secondaries sordid white, reticu-

lated with grey, the costal and apical areas reddish. Expanse of wings 8 lines.

Coll. J. D. Enys, Esq.

Dr. Hector also possesses a faded example of this species.

120. CACOËCIA TAIPANA.

Tortrix taipana, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 46.

Coll. Dr. Hector.

Felder's figure is a little too decided, judging from Dr. Hector's example. The two preceding species belong to the same group with *C. costana*.

121. CACOËCIA INANA, n. sp. (Plate XLIII. fig. 13.)

Primaries above pale clay-brown, irrorated with grey, costa indistinctly spotted with grey; secondaries silky white, reticulated with grey; thorax clay-brown; abdomen whitish: wings below white, reticulated with dark grey, costal borders tinted with testaceous; body below sordid white, venter with lateral black dots. Expanse of wings 1 inch 3½ lines.

Coll. Dr. Hector.

Mr. Enys has an example of a species somewhat resembling *Rhacodia rureana* of Felder. It may be a *Cacoëcia*; but as it has lost its palpi, I cannot venture to describe it.

122. HETEROGNOMON EXCESSANA.

Teras excessana, Walker, Lep. Het. xxviii. p. 303 (1863).

Colls. Dr. Hector and J. D. Enys, Esq.

123. (SCIAPHILA) SPOLIATANA??

Sciaphila spoliatana, Walker, Lep. Het. xxviii. p. 356 (1863).

Coll. Dr. Hector.

The single example is much rubbed, and injured by mites; it may have nothing to do with Walker's species: several of Walker's types have the wings closed, and thus are not easily recognized.

124. ZELOTHERSES? ROBUSTA, n. sp. (Plate XLIII. fig. 17.)

♂ ♀. Primaries sordid white, acute; a broad oblique patch beginning just within the base of the discoidal cell and terminating in a point near to the centre of inner margin, a slender subcostal dash near the base, five spots on the apical half of costa, a squamose patch across the median veins, and the terminations of the nervures black-brown; secondaries greyish, particularly towards the outer margin; body sordid white: primaries below grey, the costal margin white, crossed by greyish spots towards apex; secondaries paler grey, the costa white; body below white. Expanse of wings 4½ lines.

Coll. Dr. Hector.

A curious little species, found on the Canterbury plains amongst scrubby bushes.

125. STEGANOPTYCHA? NEGLIGENS, n. sp. (Plate XLIII. fig. 18.)

Primaries sordid white, clouded with yellow; a broad oblique subbasal blackish band, not reaching the costal margin; a broad slightly angulated oblique central band, yellowish irrorated with grey above the median vein, becoming reddish-brown below it; the apical half of costal margin and the outer margin spotted with ferruginous, fringe grey; secondaries brown, costal area white; head white, collar and shoulders yellow, tegulæ whitish; thorax and abdomen brown: primaries below pale brown, costal and external borders alternately white and brown; secondaries white, the veins, abdominal area, and a streak through the cell brown, fringe brown crossed by a central pale line; body below white. Expanse of wings 4½ lines.

Canterbury plains. Coll. J. D. Enys, Esq.

Seems allied to *S. dealbana*; but the primaries are slightly narrower.

CHOREUTIDÆ.

126. OROSANA ATRA, n. sp.

Shining purplish brown; primaries with a spot close to the base, a zigzag transverse subbasal line, a spot at the end of the cell, and a sigmoidal discal line from costa to inner margin black; a dot beyond the cell, and two subapical marginal dots, creamy whitish; collar below clothed with white hairs. Expanse of wings 4½ lines.

Canterbury plains. Coll. J. D. Enys, Esq.

The darkest known species of this little Australian genus.

TINEITES.

TINEIDÆ.

127. TINEA RECTELLA.

Tinea rectella, Walker, Lep. Het. xxviii. p. 482 (1863).

Colls. Dr. Hector and J. D. Enys, Esq.

128. TINEA PALÆSTRICA, n. sp.

Primaries with the basal third dark brown, remainder of the wing sandy whitish; a large round spot beyond the cell, encircled by a complete series of smaller spots, all grey; beyond this a longitudinal streak of grey, bounded on each side by two black dots; fringe, excepting at external angle, brownish; secondaries shining sandy whitish; head snow-white, tufted; thorax brown, a yellow spot on the centre of the prothorax; abdomen testaceous: wings below shining testaceous; body rather darker testaceous. Expanse of wings 8 lines.

Coll. Dr. Hector.

Closely allied to the European *T. tapetzella*.

PLUTELLIDÆ.

129. CEROSTOMA FULGURATELLA.

Cerostoma fulguratella, Walker, Lep. Het. xxviii. p. 548 (1863).

Coll. J. D. Enys, Esq.

GELECHIIDÆ.

The New-Zealand species referred to *Gelechia* by Mr. Walker are (as Mr. McLachlan has pointed out to me) none of them members of that genus. The following should be referred to *Œcophora*—*Gelechia innotella, intactella, monospilella, flavidella, collitella, convulsella*, and *contextella*.

Gelechia subditella is identical with the European *Endrosis fenestrella*.

130. ŒCOPHORA PSEUDOSPRETELLA.

Œcophora pseudospretella, Stainton, Cat. 14, I. B. 162 (1854).

Colls. Dr. Hector and J. D. Enys, Esq.

A common European species.

131. ŒCOPHORA SORDIDA, n. sp.

Primaries pale shining brown; a small arched marking just beyond the end of the cell, the outer border, and fringe grey; secondaries silvery white; body testaceous: wings below silvery white, primaries slightly brownish; pectus (apparently) silvery white; legs and venter pale testaceous. Expanse of wings 10 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

Allied to the preceding species.

132. ŒCOPHORA GRISEATA, n. sp.

Wings and body above shining grey; primaries irrorated with brown, crossed by two widely separated indistinct oblique brown lines, the inner one angulated at the median nervure, the outer one, which is discal, deeply excavated in the middle; a spot of the same colour at the end of the cell; secondaries with a feeble brassy tinge: primaries below shining brown, fringe grey; secondaries sordid white, speckled with brown; body below pale brown; legs white internally. Expanse of wings 7 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

133. ŒCOPHORA PARCA, n. sp.

Primaries pale shining straw-yellow, fringe white; secondaries silvery white; thorax yellow, abdomen white: primaries below shining whity-brown; secondaries silvery white; body below white. Expanse of wings 8 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

Allied to *Œ. apertella*.

Psecadia teras of Felder is *Œcophora picarella* of Walker.

134. TACHYPTILIA ATYCHIOIDES, n. sp. (Plate XLIII. fig. 14.)

Primaries above purplish brown; discoidal cell white, crossed by a large central subquadrate black spot, terminated by a smaller black spot; a small white spot beyond the cell, and a discal arched white line; apex bronzy brown; fringe brown, whitish towards apex; secondaries coppery brown, two sordid whitish longitudinal streaks, one within the cell, the other on interno-median area; costa

and fringe white, the latter brownish at anal angle; body above dark brown, collar and prothorax varied with ochraceous; hind margins of tegulæ fringed with whitish; abdomen with whitish hind margins to the segments: primaries below bronzy-brown, pale towards the base, crossed towards apex by a series of ill-defined whitish dots, fringe greyish; secondaries sordid white, shining, clouded (excepting at apex and outer border) with grey; body below pearly whitish; tibiæ and tarsi of legs above banded with black. Expanse of wings, ♂ 7 lines, ♀ 9 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

A puzzling little species, with the general coloration of *Atychia*.

135. CRYPTOLECHIA CARNIFEX, n. sp.

Primaries flesh-colour, costal margin blood red, the same colour also extending for a short distance down the fringe, which is throughout rather darker than the body of the wing; secondaries white, slightly tinted with flesh-colour at the borders; thorax flesh-coloured; palpi and femora and tibiæ of anterior legs carmine: wings below nearly as above, excepting that the secondaries show three or four apical marginal dark grey spots; body below white. Expanse of wings 11 lines.

Coll. J. D. Enys, Esq.

C. carnifex is allied to Walker's *Depressaria moderatella* from Tasmania.

136. CRYPTOLECHIA RUFOSPARSA, n. sp.

Primaries straw-yellow, clouded with flesh-colour and regularly dotted with indistinct reddish spots; secondaries silvery white; thorax straw yellow; abdomen pale testaceous (possibly white in fresh examples): wings below silvery white; primaries with the costa and fringe yellow; anterior tibiæ carmine; anterior femora flesh-colour; body below white. Expanse of wings 10 lines.

Coll. J. D. Enys, Esq.

137. CRYPTOLECHIA GALACTINA.

Cryptolechia galactina, Felder, Reise der Nov. Lep. v. pl. cxl. fig. 34.

Coll. J. D. Enys, Esq.

A pure white species.

GRACILARIIDÆ.

138. GRACILARIA LINEARIS, n. sp. (Plate XLIII. fig. 16.)

Primaries clay-brown, crossed by oblique series of blackish dots, in certain lights uniform lilacine brownish, shining; secondaries white, fringes at apex slightly tinted with testaceous: thorax coloured like the primaries, abdomen testaceous: wings below silvery whitish, primaries slightly brownish in tint: body below white. Expanse of wings 5 lines.

Coll. Dr. Hector.

Allied to *G. arenosella*.

139. PLATYPTILUS REPLETALIS.

Platyptilus repletalis, Walker, Lep. Het. xxx. p. 931 (1864).
Coll. J. D. Enys, Esq.

140. ACIPTILUS MONOSPILALIS.

Aciptilus monospilalis, Walker, Lep. Het. xxx. p. 950 (1864).
Coll. J. D. Enys, Esq.
I believe *A. patruelis* of Felder to be this species overcoloured.

EXPLANATION OF THE PLATES.

PLATE XLII.

Fig. 1. *Meterana pictula* ♀, p. 386.
2. *Graphiphora tartarea* ♂, p. 384.
3. *Apamea vitiosa* ♂, p. 384.
4. *Euclidia hectori* ♀, p. 387.
5. *Agrotis mitis* ♂, p. 383.
6. *Hadena debilis* ♀, p. 385.
7. *Porina enysii* ♂, p. 381.
8. *Fidonia ferox* ♀, p. 392.
9. —— *enysii* ♀, p. 391.
10. *Gonodontis felix* ♀, p. 389.
11. *Herminia lilacina* ♂, p. 388.
12. *Bityla sericea* ♀, p. 387.

PLATE XLIII.

Fig. 1. *Aspilates insignis* ♂, p. 393.
2. *Fidonia catapyrrha*, p. 392.
3. —— *anceps*, p. 392.
4. *Cacopsodos niger*, p. 395.
5. *Declana Feredayi*, p. 398.
6. *Cidaria beata*, p. 397.
7. *Crambus vulgaris* (enlarged), p. 400.
8. *Pseudocoremia indistincta*, p. 394.
9. *Hypochalcia corrupta* (enlarged), p. 399.
10. *Aphomia strigosa*, p. 398.
11. *Eromene metallifera* (enlarged), p. 401.
12. *Chilo simplex*, p. 400.
13. *Cacoëcia inana* (enlarged), p. 403.
14. *Tachyptilia atychioides* (enlarged), p. 405.
15. *Cacoëcia vilis* (enlarged), p. 402.
16. *Gracilaria linearis* (enlarged), p. 406.
17. *Zelotherses? robusta* (enlarged), p. 403.
18. *Steganoptycha? negligens* (enlarged), p. 404.

3. On a small Collection of Birds from the Marquesas Islands. By OTTO FINSCH, Ph.D., C.M.Z.S., Director of the Bremen Museum.

[Received April 12, 1877.]

Through the Museum Godeffroy, at Hamburg, I have received a small collection of birds in alcohol, made by Mr. A. Garrett, the well-known naturalist of that Museum, during a visit to the Marquesas Islands. As our knowledge of the Marquesas birds is still very limited, I think it will be of interest to report on this collection, the more so as it contains, with the exception of four species (*Coriphilus smaragdinus*, *Eudynamis taitianus*, *Serresius galeatus*, and *Phlegœnas rubescens*), examples of all the land-birds known to inhabit this group, which

number altogether 10 species. One of these, a Kingfisher, although known already to Forster, proves to belong to an unnamed species. A closer exploration of the group will probably bring to light further species, peculiar to the different islands, such as, under similar circumstances, the excellent researches of Mr. Layard have recently made known to us in the Feejee group.

1. Collocalia cinerea (Gm.).

Herse Forsteri, Hartl.
C. vanicorensis, part., Finsch & Hartl. Orn. Central-Polyn. p. 47.

One specimen, agreeing generally with the description communicated to me by Dr. von Pelzeln from a Tahitian specimen in the Vienna Museum (*vide* Journ. d. Museum Godeffroy, Heft xii. 1876, p. 25); but the coloration is as dark as in *C. vanicorensis*; the rump is not pale, as in *C. spodiopygia*, but uniform with the remaining upper parts; the single feathers show very narrow light lateral margins; but these are hidden.

The specimen seems, therefore, to be identical with the Tahitian species first mentioned from this locality by Forster, and agrees exactly in its larger size, by which it may be distinguished from the other species inhabiting the Pacific.

2. Halcyon godeffroyi, sp. nov.

Alcedo collaris, var. ii., Forst. Descr. Anim. 1844, p. 163.
Todirhamphus, sp., Hartl. Journ. f. Orn. 1834, p. 170.

Adult. Head, neck, mantle, and whole under surface, including the under wing-coverts, white; shoulders, lower back, quills, and tail cobalt-blue; inner webs of wings smoky black, margined with white; from the lores through the eye and temporal region a narrow black band encircling the nape; basal half of bill black, lower mandible pale horn-colour; feet black.

There are three specimens which agree perfectly with the description above given. The white middle portion of the mantle is faintly stained with rusty.

Young. Frontal margin, extending as a narrow supercilium to above the eye white; remainder of head obscure marine-blue (on the crown appear three new pure white feathers); lores and a broad band around the nape dull black, the same as the hind neck and upper portion of the mantle; on the hinder mantle some white feathers, washed with pale rusty; under surface white, with dark edgings to the feathers of the sides of the crop; smaller upper wing-coverts with narrow whitish tips.

	Long tot.	al.	caud.	culm.	latit. rostr. a basi.
	in.	in. li. in. li.	in. li. in. li.	li.	lin.
H. godeffroyi	..8¼	3 7–3 8	2 6–2 7	15–16	7–7½
H. albicilla		4 7	3	24	7½

The Kingfisher of the Marquesas has not come under examination since the time of Forster, who described the bird correctly as a

variety of his *Alcedo collaris*, from the Island of St. Christina. This island is the "Tahuata" of the new maps, a small island separated by the Bordelaise Straits from Hiwaoa, the chief eastern island of the Marquesas group. As this supposed variety of Forster's has remained unnamed since his time, I take a pleasure in bestowing on it the name of Mr. Johann Cesar Godeffroy, who has contributed through his travels so much to a better knowledge of the Polynesian Islands.

H. godeffroyi is a true miniature of *H. albicilla*, Less., from New Guinea and the Eastern Moluccas, but may be distinguished, besides its inferior size, by the white of the hind neck running down to the middle part of the mantle. In this respect it differs also, even in its young state, from *H. tuta*, the occurrence of which on the Marquesas rests merely on the labels of the Leiden and Dresden Museums, and has not been verified by any traveller.

3. TATARE LONGIROSTRIS (Gm.); Finsch & Hartl. Ornith. Central-Polyn. p. 66.

Three specimens, agreeing perfectly with examples from the Society Islands (Eimeo and Huahine).

4. MONARCHA NIGRA (Sparrm.); Finsch & Hartl. Ornith. Central-Polyn. p. 90.

An extensive series of 12 specimens, representing all the stages of plumage which were formerly considered to belong to different species.

Four specimens in a uniform black dress are, no doubt, in full plumage.

Four specimens are in the rusty plumage (*Muscicapa lutea*, Gm.), and are apparently young birds:—

Upper parts dark rusty brown, quills and tail darker; the remiges margined externally rusty; lores, sides of head and neck, and the whole under surface light rufous, paling to rufous white on the middle of breast and vent; anal region nearly white. Bill yellowish, the culmen greyish. The protracted yellow angle of the mouth gives these birds the appearance of young ones.

Five specimens show transitions in plumage from white to black, and from rusty to black; all these birds are moulting:—

Head, chin, throat and quills black, the remaining parts white, but varied with black feathers on the shoulders and mantle; tail in one nearly uniform white, in others irregularly tipped with black, in one the outmost feather rusty; primaries margined externally more or less with white, in one specimen with rusty.

Specimens changing from rusty to black:—

Black; wing-coverts margined with rusty, as are also some of the primaries; shoulders dark rusty-brown, like the tail; two middle tail-feathers black; lower breast and abdomen pale rufous, flanks dark rufous; under tail-coverts black.

In another specimen, agreeing otherwise with the foregoing, the under tail-coverts are dark rusty, and the black of the head is mixed with dark brown feathers.

The size differs a good deal, as well as the form of the bill, which in some examples appears more flat and enlarged, in others more slender, differences, however, not to be expressed by measurements.

Long alæ.		caudæ.		culm.	tars.	
in. li.	in. li.	in. li.	in. li.	li.	li.	
3 5–3	7	2 7–2	11	6 –6½	11⅓	(black form).
3 4–3	6	2 9		5¼–5¾		(black and white form).
3 1–3	2	2 7		5½–6		(rufous form).

M. nigra has been found likewise on the Friendly and Society Islands; Dr. Graeffe, however, did not meet with this species on the Tonga Islands (*vide* Finsch, Journ. f. Orn. 1870, p. 119).

5. PTILINOPUS DUPETITTHOUARSI (Neboux); Finsch & Hartl. Ornith. Central-Polyn. p. 129.

Old and young birds of this peculiar species; the latter show already the whitish sincipital mark so characteristic of this species.

Bill horn-green; eye-ring bright red; feet pale red.

6. PTILINOPUS MERCIERI (Des Murs); Finsch & Hartl. Ornith. Central-Polyn. p. 128.

Two specimens.

This very rare fruit-pigeon, which I have now had the pleasure of examining for the first time, is a very remarkable species, distinguished at once by the extent of dark purple red on the head, which occupies not only the forehead and vertex, but also the lores, extending thence in a large patch to the base of the lower mandible. From above the eye the red cap is surrounded by a broad circle of bright yellow; the chin and throat are yellowish; breast and remaining under surface, inclusive of the lower tail-coverts, of a uniform dark yellow.

Bill horn-green; eye-ring red; feet dirty purplish.

Long. alæ.		caudæ.	culm.	tars.
in.	lin.	in.	lin.	lin.
5	1	3	5	10

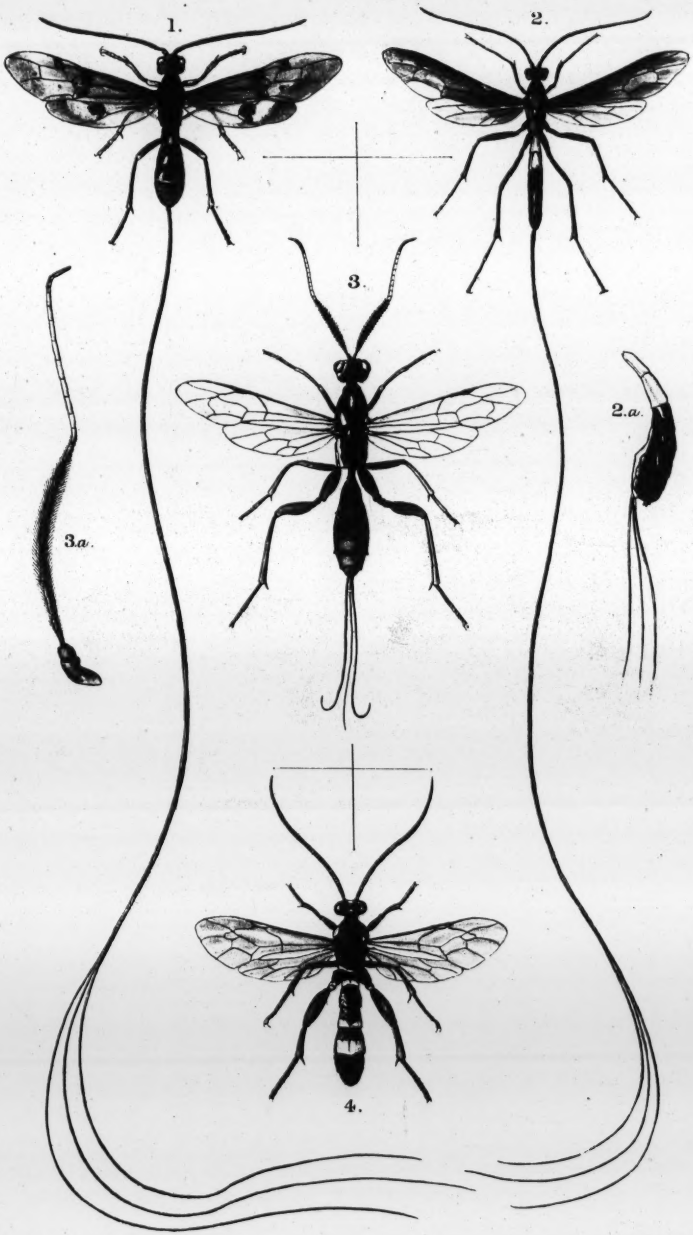
It is very interesting to find in one and the same group of small islands two such very different species of *Ptilinopus*.

4. Descriptions of four new Species of Ichneumonidæ in the Collection of the British Museum. By FREDERICK SMITH.

[Received April 13, 1877.]

(Plate XLIV.)

Of the Ichneumons which I now describe three are probably the most remarkable species to be found in the entire family. Two of them I cannot assign to any genus yet established; a new one has



E. A. Smith.

Mintern Bros. imp.

NEW SPECIES OF ICHNEUMONIDÆ.

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consequently been formed for the reception of each. *Perissocerus plumicornis* is remarkable in having its antennæ plumose more than half their length. The genus is undoubtedly closely allied to *Xylonomus*; but its extraordinary antennæ, elbowed at the joint where the pubescence terminates, appear sufficiently to warrant its generic separation. *Dolichomitus longicauda* is allied to the genera *Ephialtes* and *Rhyssa*; but its falcate and compressed abdomen removes it from the former genus, and the incised and tuberculate segments sufficiently distinguish it from the latter. The new species of *Bracon* is remarkable in having an ovipositor over nine times the length of its body, being the most remarkable instance known of the elongation of that instrument. The new species of *Metopius* is the only one known to me from China, or indeed from that part of the world, including India and the islands adjacent.

METOPIUS SINENSIS. (Plate XLIV. fig. 4.)

Black, strongly punctured, with the apical margins of the first, third, and fourth segments yellow. Head—the front yellow as high as the insertion of the antennæ; a narrow yellow line runs up a little way close to the eyes, and an angular shape is produced between the antennæ; a large ovate black macula in the middle of the front; the flagellum of the antennæ fulvous beneath. Thorax—above the puncturing is strong and confluent; the scutellum quadrate, and produced over the postscutellum and base of the metathorax; the lateral margins sharply elevated, and produced posteriorly into stout compressed teeth; the wings slightly fulvo-hyaline, the nervures rufo-fuscous, the stigma pale ferruginous; the tibiæ, tarsi, and posterior trochanters more or less obscurely ferruginous; the anterior femora ferruginous in front; the posterior femora incrassate. Abdomen with confluent punctures, the second and base of the third rugose; the yellow fascia on the basal segment subinterrupted; that on the third broader, and deeply emarginate in the middle; on the fourth segment the band is very broad, and occupies more than half the segment; the fifth and sixth segments have a purple tint.

The male differs in being rather smaller, and in being more variegated with yellow; the face is entirely yellow, as well as the scape and the antennæ in front; on the sides of the thorax are two longitudinal and one vertical yellow stripe; the anterior and intermediate legs are yellow, the femora of the former being more or less black behind; the femora of the latter are black in the middle, and the posterior pair yellow at their base and apex; the tips of the spines on the scutellum are also yellow.

Hab. Shanghai.

Collected by Mr. R. Fortune.

Genus DOLICHOMITUS, Smith.

Antennæ setaceous; the scape truncate laterally; the flagellum multiarticulate, the joints gradually decreasing in length from the basal one; the head transverse. The anterior wings with an elon-

gate marginal cell and three submarginal ones, the first submarginal elongate, broad at the base, and narrow towards the apex; the second submarginal minute, subtriangular, and with a short petiole; the third submarginal elongate, narrow, and extending to the apex of the wing; the anterior tarsi twice the length of the tibiæ; the posterior tarsi only a little longer than the tibiæ; the claws of the tarsi bifid; the pulvillus small. Abdomen curved, narrowed at the base, and slightly compressed; the two basal segments of equal length, the three following of equal length and a little shorter than the basal one; the two apical segments shorter than the fifth; the ovipositor nearly seven times the length of the insect.

DOLICHOMITUS LONGICAUDA. (Plate XLIV. figs. 2 and 2 *a*.)

Black and shining, with the base of the abdomen yellow; wings smoky. The face finely punctured, slightly convex; a minute yellow spot, in some examples, at the lateral angles of the face, close to the base of the mandibles; the anterior margin of the clypeus broadly but slightly emarginate. Thorax—the metathorax nearly flat and oblique; wings fuscous, with a purple iridescence, the anterior margin of fore wings dark brown; the anterior tibiæ more or less ferruginous within, occasionally black. The two basal segments of the abdomen above, and all beneath, bright yellow; the sheaths of the ovipositor black, the latter ferruginous. Length 9–11 lines; of the ovipositor $3\frac{1}{2}$–$6\frac{1}{2}$ inches.

Hab. Bogota, Columbia.

Genus PERISSOCERUS, Smith.

Head subglobose; antennæ 22-jointed, joints 3rd to 7th densely pubescent, at the apex of the seventh joint the antennæ are elbowed, as is also the terminal joint. Thorax oblong; the metathorax oblong-quadrate, divided into six compartments above by two longitudinal and one transverse carina; wings with one elongate marginal cell and two submarginal ones; the posterior legs rather stout, elongate, the femora somewhat swollen; the claws of the tarsi simple and very small; the first joint of the tarsi longer than the rest united. Abdomen with a short petiole, depressed beyond the first segment, the second and third tuberculate at the base; the ovipositor nearly as long as the head and thorax.

PERISSOCERUS PLUMICORNIS. (Plate XLIV. figs. 3 and 3 *a*.)

Head and thorax black and shining; the abdomen bright ferruginous. The head subglobose; the antennæ black to the apex of the seventh joint and densely clothed with short black pubescence; the eighth joint to the fourteenth white, with the apical joints black. The mesothorax with two deep sutures, each emanating from the middle of the margin of the scutellum, and diverging forwards to the sides, and dividing the disk into three parts, which are convex, and covered with curved striæ; wings hyaline, stigma and nervures black; the coxæ, trochanters, and femora ferruginous; the tibiæ

and tarsi yellow. Abdomen ferruginous and shining; the ovipositor obscurely ferruginous, with the sheaths black and pubescent.

Hab. Amazon valley.

Collected by Mr. Henry Walter Bates.

BRACON PENETRATOR. (Plate XLIV. fig. 1.)

Rufous, with the antennæ, three basal segments of the abdomen above, the posterior legs, and the sheaths of the ovipositor black; wings flavo-hyaline, each having four black spots; the head, thorax, legs, and the apex of the abdomen pubescent. The head smooth and shining; the face with long thin fulvous pubescence; the anterior margin of the clypeus narrowly, and the tips of the mandibles, black; a small circular cavity on the vertex between the eyes, in which the ocelli are placed, black. Thorax smooth, shining, and impunctate; the wings have a pale fuscous band on their apical margins; two blackish-brown spots at the anterior margin of the fore wings, the first somewhat oblong-quadrate, covering the apex of the externo-median and the base of the second discoidal cell; the second spot is quadrate and occupies the base of the marginal cell and the apex of the stigma; a third spot, irregular in shape, is placed in the first discoidal cell; a fourth, larger, ovate spot is situated in the middle of the posterior wings; the anterior wings have also three minute paler spots, one in the second discoidal cell, a second beneath the second submarginal, and a third in the second submarginal cell; the articulations of the joints of the posterior legs are more or less rufo-piceous. Abdomen—the lateral margins of the basal segment are deeply longitudinally sulcate; the middle of the segment rufo-piceous; the lateral raised margins of the two basal segments are reddish-yellow; the basal margin of the fourth segment narrowly black; the apical margins of the third and fourth segments and the fifth and following segments rufous. Length of the body 9 lines, of the ovipositor 7 inches. (The figure is slightly enlarged.)

Hab. Yokohama (Japan).

Collected by Mr. Jonas.

EXPLANATION OF PLATE XLIV.

Fig. 1. *Bracon penetrator* ♀, p. 413.
2. *Dolichomitus longicauda* ♀, p. 412.
2 *a*. Abdomen of *Dolichomitus*.
3. *Perissocerus plumicornis* ♀, p. 412.
3 *a*. Antenna of *Perissocerus*, magnified.
4. *Metopius sinensis* ♀, p. 411.

5. Notes on the Anatomy and Systematic Position of the Genera *Thinocorus* and *Attagis*. By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received April 17, 1877.]

Through the kindness of Mr. Edward Gerrard I have become possessed of an adult specimen of *Thinocorus rumicivorus*, and of a

nestling of *Attagis gayi*, in spirit, from Chili; and I take the present opportunity of bringing before this Society my notes on their structure. Of the former of these species Mr. Eyton has fully described the visceral anatomy and the osteology in the 'Zoology of the Voyage of the "Beagle"'[1]; and in his 'Osteologia Avium'[2] will be found an account of the skeleton, together with a figure of the sternum, of the latter. By Mr. Eyton, in his account of *Thinocorus*, these birds are referred to the order Gallinæ; but in his more recent work they are included with *Chionis*, to constitute the Chionididæ, which are by him placed after the Otidæ (comprising the Otinæ and Tinaminæ), and before the Charadriidæ, as families of his order Littores. By Mr. G. R. Gray, in his 'Hand-list of Birds,' they are separated from the Chionididæ, between which and the Glareolidæ they stand as a division of the Grallæ. This is much the same position as that in which they are located by Messrs. Sclater and Salvin in their 'Nomenclator Avium Neotropicalium.' Nitzsch, as Burmeister tells us, was disposed to place them in his group of the Alectorides, along with *Chauna*, *Otis*, *Cariama*, *Psophia*, and *Grus*; whilst Wagler placed them with the Pteroclidæ; but Burmeister himself is of opinion that "this remarkable bird (*Thinocorus rumicivorus*), which Wagler very improperly compares with the Sand-Grouse (*Pterocles*), is in every particular an aberrant Scolopacine form, related to *Glareola* in exactly the same way as *Chionis* to *Hæmatopus*, or *Dromas* to *Recurvirostra*"[3].

As far as pterylography goes, not much of importance with reference to the position of the Thinocorinæ can be learnt. In that they possess a tufted oil-gland they differ from the Pteroclidæ and Columbæ, in both of which families it is nude. On the whole the pterylosis is typically Limicoline.

With reference to the alimentary canal, the tongue is simple and triangular, occupying most of the space between the rami of the mandible. The œsophagus is not large, but develops a capacious and well-defined globose crop, situated just above the furcula. The gizzard is muscular, not large, and it possesses simple triturating pads like those in the majority of non-carnivorous birds.

In the specimens of both *Thinocorus* and *Attagis* under consideration the intestines are 12·5 inches in length; but it must be remembered that the *Attagis* is a nestling. The colic cæca in the *Thinocorus* are 2·25 and 2·5 inches long; in the *Attagis* they are both 3 inches.

Myologically, the ambiens muscle is present, although slender. Both the femoro-caudal and its accessory head exist, of equal breadth. The semitendinosus, together with the accessory semitendinosus are of average size, whilst the semimembranosus is peculiarly slender. The myological formula, therefore, in conformity with the nomenclature adopted in my paper "On the Muscular System of Birds," in the Society's 'Proceedings' for 1874 (p. 111), is A B, X Y.

The vastus externus covers the biceps cruris; and in the foot the

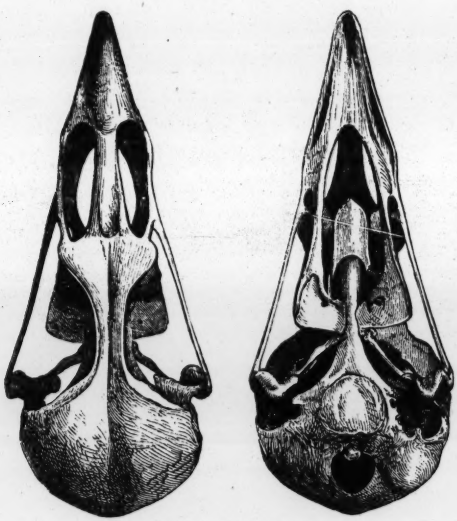
[1] Part iii. p. 155.
[2] P. 177, and plate xxi. fig. 3.
[3] Nitzsch's 'Pterylography,' Royal Society's translation, p. 139.

deep plantar tendons are arranged as in *Apteryx* and many other birds in which the hallux is small, the flexor longus hallucis blending with the flexor digitorum profundus, at the same time that a slender slip is sent off from the inner side of the conjoined tendon to the hallux[1].

In the patagium of the wing a slender muscular fasciculus runs from the biceps to a little above the middle of the tendon of the tensor patagii longus—the tendon of the tensor patagii brevis being in two parts, of which the outer is the broader and stronger. Where this latter joins the extensor carpi radialis longus a fan-shaped fibrous expansion is sent off to the middle long patagial tendon, as in the Limicolæ generally.

The obturator internus muscle is very small and oval in shape.

Both the right and left carotid arteries are developed in the two genera, which agree exactly in their myology.



Skull of *Attagis gayi*.

The lower larynx is simple, a slender muscle on each side running to the fourth bronchial half-ring, which, like the three above it, is deeper than the other bronchial half-rings, and more like a split tracheal ring.

Osteologically the Thinocorinæ present many features of interest. In his more recent communication "On Ægithognathous Birds"

[1] *Vide* P. Z. S. 1875, p. 341.

(part ii., read before this Society in February 1876, and not yet published), Prof. Parker has fully described and beautifully figured the skull of *Thinocorus rumicivorus*, and has drawn special attention to the spuriously Ægithognathous nature of the palate, with its peculiarly broad vomer, rounded in front, and there intimately connected with the nasal cartilages in a manner which much resembles the arrangement in Passerine birds. In the accompanying figure (p. 415) the palate of *Attagis gayi* is represented from a specimen most kindly lent me by Mr. T. C. Eyton, the sternum of which is that referred to above as figured in the 'Osteologia Avium.'

By comparing it with Mr. Parker's figure of *Thinocorus rumicivorus*, the almost exact identity of the two is rendered certain. In the same memoir Mr. Parker also directs attention to the nature of the anterior osseous nares, which, as he remarks, are much the same as in the Turnicidæ. Both these genera agree with the birds termed Schizorhinal by me in a previous paper[1], resembling the Limicolæ, Pteroclidæ, Columbæ, and their allies in this respect—although, on account of the shortness of the face, as in the Pteroclidæ, their schizorhinal nature is not quite so conspicuous as in such genera as *Grus*, *Ibis*, and *Scolopax*. The superior aspect of the skull of *Attagis gayi* is also represented *suprà* (p. 415).

In more than one peculiarity the skulls of *Thinocorus* and of *Attagis* differ from those of *Turnix* and *Hemipodius*[2]. The maxillo-palatines, instead of being slender throughout and simply squared off at their free ends, which are situated considerably nearer the middle line than are the inner margins of the palatine bones at the parts which they oppose, are broad, short, and swollen apically, where they scarcely project beyond the median borders of the palatines. The Turnicidæ also possess an extensive articulation between the middle of each pterygoid bone and the basisphenoid rostrum—no traces even of processes for such an articulation being present in the Thinocorinæ, in which latter subfamily also the supraorbital glands, although not largely developed, leave a small crescentic depression on the superior surface of the upper margin of the bony orbit, not present in the former group.

Continuing the comparison with the Turnicidæ, it may be mentioned that in them the left carotid artery is alone developed (in *Hemipodius tachydromus* and *Turnix lepurana* at least), whilst the accessory femoro-caudal muscle, as well as the slip to the patagium from the biceps of the arm, are wanting, at the same time that the obturator internus is large and fan-shaped, not oval and small[3]. The colic cæca, also, never exceed $1\frac{1}{2}$ inch in length, in which, as well as all the above-mentioned characters, they differ from the Thinocorinæ.

That *Turnix* and *Thinocorus* are not intimately related may be

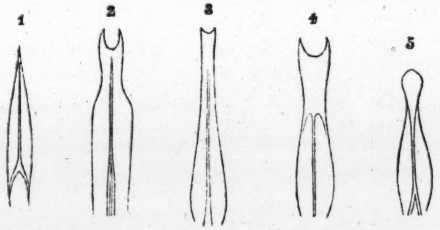
[1] P. Z. S. 1873, p. 33 *et seqq.*

[2] For most instructive figures and descriptions of the skulls of *Turnix* and *Hemipodius* see Prof. Parker's paper "On Ægithognathous Birds," part i., Trans. Zool. Soc. vol. ix. pl. liv. and p. 294.

[3] *Vide* P. Z. S. 1876, p. 195.

therefore considered certain, notwithstanding the partial resemblance of their vomers.

Next with reference to *Chionis*. By De Blainville this genus has been located close to *Hæmatopus*[1]; and his view has been accepted, to a greater or less extent, by many. Nevertheless, although these birds are both strictly schizorhinal, their skulls give indications of a very different affinity. *Hæmatopus* possesses supraoccipital foramina, as well as pterygoid articulations with the basisphenoid, together with a bifid vomer, as represented in fig. 2. The similarly formed vomer is extraordinarily broad in *Recurvirostra avocetta*, which is shown in



Anterior extremity of vomer in:—1. *Sterna hirundo*; 2. *Hæmatopus ostralegus*; 3. *Numenius arquatus*; 4. *Recurvirostra avocetta*; 5. *Chionis alba*.

fig. 4, agreeing with the restricted Limicolæ; whilst in *Chionis* the vomer is blunt (fig. 5), and the basisphenoid rostrum, as well as the pterygoids, are entirely free as far as articulating facets are concerned. In the Bulletin of the United States National Museum[2] Dr. E. Coues and Mr. Kidder, after a most careful study of the whole anatomy of the genus, *Chionis minor* especially, remark, "We find in *Chionis* a connecting link, closing the narrow gap between the plovers and gulls of the present day. In our opinion this group represents the survivors of an ancestral type from which both gulls and plovers have descended"[3]. A separate division, termed Chionomorphæ, is established for them, comparable with the Geranomorphæ and the Cecomorphæ of Prof. Huxley[4]. My dissections of both *C. alba* and *C. minor* are quite in favour of this Larine affinity. That the genus deserves to be located in a separate division, however, as Dr. Coues suggests, I cannot agree. The Cecomorphæ of Prof. Huxley include the Laridæ, Procellariidæ, Colymbidæ, and Alcidæ; and it is now known that neither the Procellariidæ nor Colymbidæ come near the Laridæ and Alcidæ, which two last-named families are related one to the other most intimately, and differ from one another to almost exactly the same amount as the Chionididæ do from either. I should place the Chionididæ, the Laridæ, and Alcidæ

[1] Annales des Sciences Naturelles, vi. 1836, p. 97.
[2] No. 3, p. 85, Washington, 1876.
[3] *L. c.* p. 114.
[4] P. Z. S. 1867, p. 457.

in sequence as members of the Limicolæ[1]; and such being the case, their intimate affinities with the Thinocorinæ scarcely need further notice. The bifid vomer of *Numenius arquatus*, as shown in fig. 3, p. 417, closely resembles that of most of the Limicolæ proper. The vomer is always sharp-pointed in the Larinæ, as in *Sterna hirundo* (fig. 1, p. 417), with which *Chionis* generally agrees.

In *Cursorius* and *Glareola* the vomer is not expanded laterally. In them, however, there is an absence of pterygoid facets for articulation with the basisphenoid rostrum, together with a general resemblance between their palates and those of the Thinocorinæ. In their myology these genera do not differ in any essential points from *Thinocorus* and *Attagis*; and it is with these that I cannot help thinking that *Thinocorus* and *Attagis* are most allied. Not in any of these genera are the pair of supraoccipital foramina to be found, which are present in nearly all the Charadriidæ and the Gruidæ.

May 15, 1877.

Prof. A. Newton, F.R.S., V..P, in the Chair.

The following report on the additions to the Society's Menagerie during the month of April 1877 was read by the Secretary:—

The total number of registered additions to the Society's Menagerie during the month of April 1877 was 74, of which 28 were by presentation, 16 by purchase, 5 by exchange, 8 by birth, and 17 were received on deposit. The total number of departures during the same period by death and removals was 105.

The most noticeable additions during the month were:—

1. A Ceylon Fish-Owl (*Ketupa ceylonensis*), from Ceylon, presented April 4th by Capt. H. B. Turner. This fine Owl is new to our published list, and has not been represented in the Gardens for many years, though I believe we formerly had a living example of it.

2. A female Bohor Antelope (*Cervicapra bohor*), transmitted by the Sultan of Zanzibar, along with other animals, to the Prince of Wales, and deposited by His Royal Highness in the Gardens on April 24th. This Antelope is new to the Society's collection.

3. A Pygmy Marmoset (*Hapale pygmæa*), purchased April 27th, and stated to have been obtained at Pebas, on the Upper Amazons. No previous living example of this beautiful little Marmoset has, so far as I am aware, reached Europe alive. The iris is of a clear reddish brown.

[1] *Vide* P. Z. S. 1874, p. 123. I may here mention that Dr. Coues's account, in the above-quoted paper, of the myology of *Chionis minor* is incomplete as far as the varying muscles are concerned; and I may add that in both species the ambiens muscle is of fair size, the external vastus covers the biceps cruris, the femoro-caudal with its accessories and the semitendinosus with its accessories are well developed. The internal obturator is oval; and there is a slip from the biceps humeri to the patagium. There are two carotid arteries, and intestinal cæca 5 inches long in *C. alba*, 6 inches in *C. minor*.

Spix obtained his specimen at Tabatinga; Mr. E. Bartlett got a single example on the Huallaga[1]; and Castelnau and Deville brought home a series[2] from the Upper Amazons, but do not give the exact locality.

4. Two specimens of the rare Yellow-throated Parrot, *Caica xanthomera* (G. R. Gray), which arrived along with the Pygmy Marmoset, also quite new to the collection.

Mr. Sclater made some remarks on the progress and condition of the Zoological Gardens of Rotterdam, Amsterdam, Antwerp, Brussels, and Ghent, which he had lately visited.

In Rotterdam he had seen a pair of the West-African Jackal described and figured in the Society's 'Proceedings' (1870, p. 279, pl. xxiii.) as *Canis lateralis*, and a fine specimen of *Casuarius uniappendiculatus*.

At Amsterdam Mr. Sclater had found the young male Hippopotamus, born on the 3rd of August, 1876, in excellent health and condition, and another young one expected shortly. Two examples, nearly adult, of *Casuarius uniappendiculatus* were in the collection, one of which Mr. Westerman has consented to part with to this Society.

At Antwerp M. Vekemans was busy on the construction of a new Lion-house, about 230 ft. long by 65 ft.—that is, of about the same dimensions as the Society's newly-constructed building.

A communication was read from Dr. G. S. Brady, C.M.Z.S., containing a memoir on the Fossil Ostracoda of the Antwerp Crag. This paper will be published in the Society's 'Transactions.'

The following papers were read:—

1. Notice of the Capture of *Coregonus oxyrhynchus* in Lincolnshire. By Francis Day, F.Z.S.

[Received May 7, 1877.]

Amongst a consignment of fresh fish received on April 17th, this year, at Cheltenham, from Lincolnshire, I observed a *Coregonus*[3], along with some Smelts (*Osmerus eperlanus*). So far as I am aware, *Coregonus oxyrhynchus* has not been previously recorded as either a visitor to or resident along the coasts of Great Britain or Ireland.

The genus *Coregonus* has been divided into those forms having

(*a*) The lower jaw the longer,

(*b*) The upper jaw the longer.

Amongst those comprising this latter division, a soft prolongation of the snout may be present or absent.

[1] See P. Z. S. 1871, p. 220.

[2] See Casteln. and Dev., Exp. de l'Am. d. S. Mamm. p. 20*, pl. v. figs. 1 & 2.

[3] The fishmonger assured me that there was a second example, which I did not see.

The British species have been restricted to three (or perhaps four), in none of which has the snout a soft conical prolongation.

The *C. oxyrhynchus* belongs to the subdivision in which a soft conical prolongation of the snout is present.



Coregonus oxyrhynchus.

The specimen I obtained is about 7 inches in length, and may be briefly described as follows:—

B. ix, D. 14, P. 15, V. 6, A. 15, L. l. 80, L. tr. $\frac{8}{12}$.

Length of head 5, of caudal fin $5\frac{1}{2}$, height of body 6 in the total length. Eyes, diameter $4\frac{1}{2}$ in the length of the head, $1\frac{1}{2}$ diameter from the end of snout, and $1\frac{1}{4}$ apart. Teeth absent from the jaws. Fins, pectoral as long as the head excluding the snout. Scales, $7\frac{1}{2}$ rows between the lateral line and base of the ventral fin.

As this fish is found along the coasts and entering the fresh waters of Holland, Germany, and Denmark, it is remarkable that it has not been recorded from the east coast of England, as stragglers are probably of no rare occurrence.

2. Notes on the Species of the Genus *Batrachostomus* inhabiting the Indian Region. By Arthur, Marquis of Tweeddale, F.R.S.

[Received May 15, 1877.]

(Plates XLV.–XLIX.)

The rarity in our collections of examples representing the different members of the genus *Batrachostomus* in all their various states of plumage, the want of field-collectors' notes to elucidate the few that do exist, the variability and intricacy of the markings by which they are characterized, and consequent difficulty, more especially in the males (?), of conveying by mere description, and even by coloured drawings, an adequate conception of their distinctive external characters, have combined to retard our knowledge of the genus.

The group was unknown to the older zoologists; and Dr. Hors-



J Smit lith.

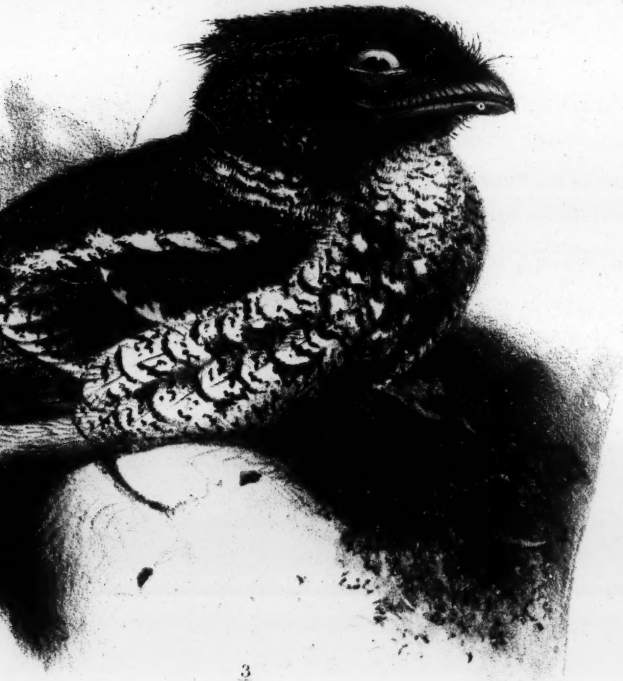
Hanhart imp.

BATRACHOSTOMUS AFFINIS ♀.



J.Smit. lith.

BATRACHOST



$\frac{3}{4}$

CHOSTOMUS CORNUTUS, ♂

$\frac{2}{3}$

BATRACHOST



$\frac{2}{4}$

Lemaire imp.

CHOSIENUS STELLATUS, J.

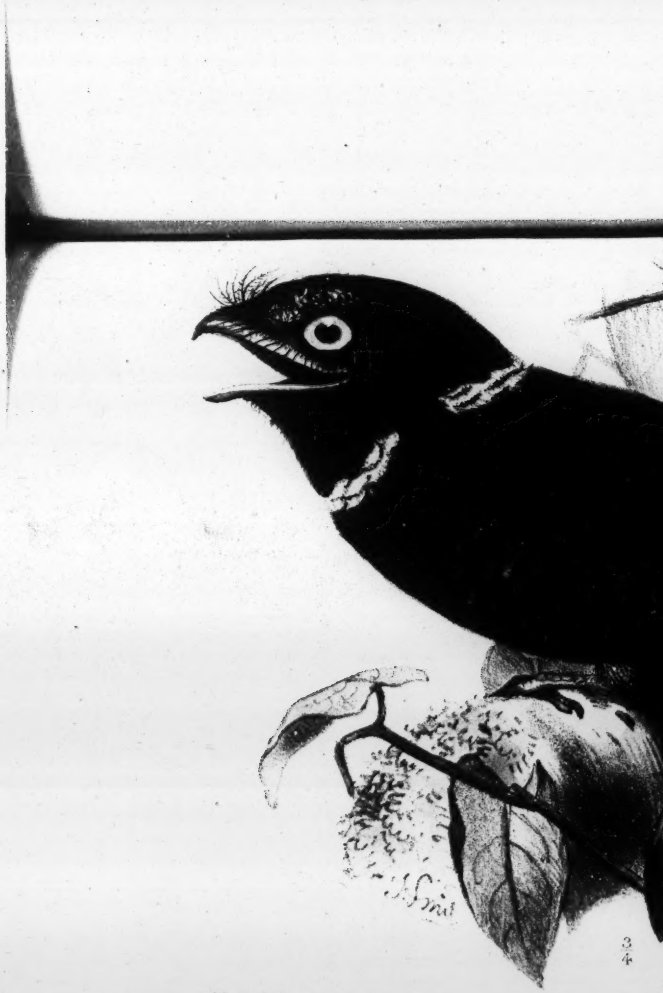
3/4

BATRACHOSTOMU



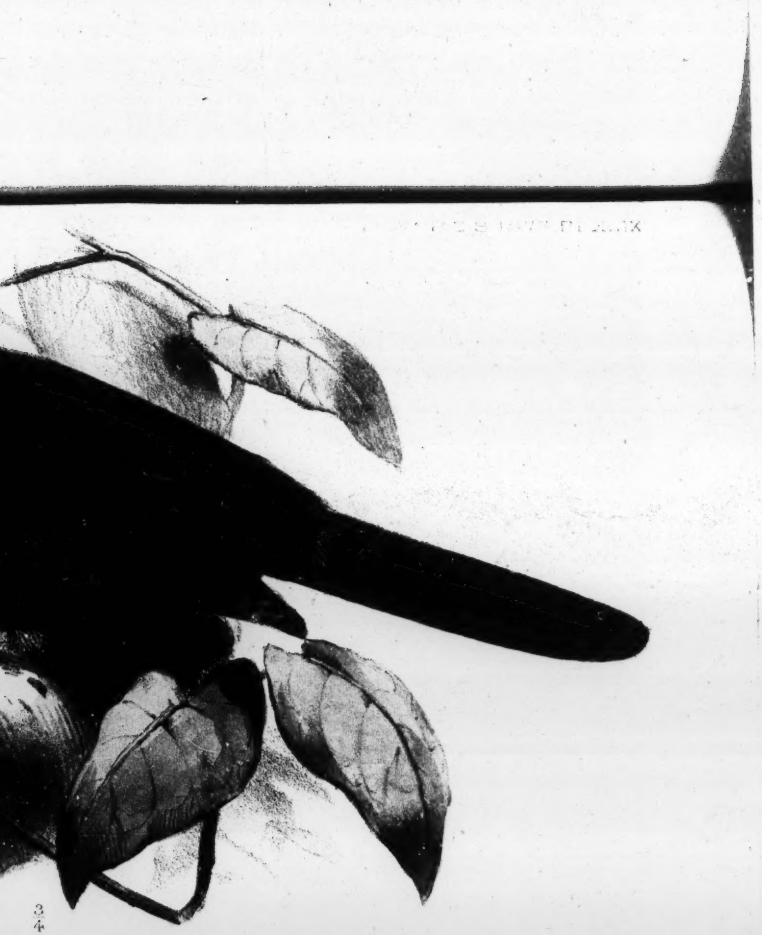
Hanhart imp.

STOMUS MONILIGER, ♂



3/4

J.Stuart lith.



3/4

Hanhart imp.



field was the first naturalist who described (1820), and afterwards figured, one of its members, an inhabitant of Java—*B. javensis*. Temminck soon afterwards (1823) described and figured another species from Bencoolen, in Sumatra, obtained by Messrs. Diard and Duvaucel, probably under the auspices of Sir Stamford Raffles; and a few years later (1830) Vigors made known the giant form of Sumatra, *B. auritus*, sent to England among the collections of Sir Stamford. In 1837 Mr. Gould added a fourth species, *B. stellatus*, describing it as inhabiting Java. Dr. Jerdon, in his Second Supplement to his 'Catalogue of the Birds of Southern India' (1845), announced the discovery by Capt. Roberts of a representative of the genus in Peninsular India, which, however, he never saw, and which up to this date remains unidentified. Not many years elapsed before Blyth (1847) published an account of a sixth species, obtained at Malacca by Mr. Frith, *B. affinis*; and two years later he received from Darjeeling the fragments of two nestlings, which he identified as belonging to this species (*l. c.*). In Ceylon, Layard discovered and so added another species to the list (which may or may not be the same as the South-Indian form)—a species described by Blyth (1849) under Layard's title of *B. moniliger*. The whole of these six or seven species were in rufous or rufous-brown plumage; but in 1850 Bonaparte (*l. i. c.*) made known the fact that each sex in one species at least (*B. javensis*) wore a plumage peculiar to itself—a statement reiterated in wider terms and confirmed by Prof. Schlegel (*l. i. c.*) four years later. This important fact did not deter Mr. G. R. Gray from describing in 1857 a bird in grey and brown mottled plumage obtained the year before by Mr. Hodgson's collectors at an elevation of some 3000 or 4000 feet behind Darjeeling, as belonging not only to a new species but to a distinct genus—*Otothrix hodgsoni*.

From the year 1849 until the date of the visit of the 'Challenger' Expedition to the Philippines, the efforts of naturalists, while considerably increasing and correcting our knowledge of the geographical distribution of the *Batrachostomi*, had not made known any new species. Mr. Blyth had already announced the occurrence of *B. auritus* in Malacca; and Mr. Low has discovered it in Borneo. Mr. Motley obtained *B. cornutus* at Banjarmassing, in Borneo; and the Marchese Doria found it at Sarawak. Tickell has figured and described *B. affinis* from Burma; and Lieut. Wardlaw Ramsay discovered the same species in the plumage of *Otothrix hodgsoni* on the Karen-nee hills in that country. The range of *B. stellatus* has been made to include Malacca by Mr. Blyth's researches, and extended to Borneo (Sarawak) by Marchese G. Doria. Mr. Bourdillon has quite recently discovered in Travancore examples of a species of the genus which, while confirming Dr. Jerdon's statement that one of its members occurred in Southern India, may prove to be a distinct form. And, lastly, the Philippine island Mindanao has been added to the area of the genus (as restricted), by the discovery there made by the naturalists of the 'Challenger' Expedition of a large species. Examples of the genus, so far as at present recorded, therefore present themselves in Ceylon, Southern India (Wynaad, Travancore),

the vicinity of Darjeeling, Tung-goo and Karen-nee in Burma, Malacca, Sumatra, Borneo, Java, and Mindanao.

It was an *à priori* and a natural inference of many ornithologists that the bright-plumaged birds of the genus *Batrachostomus* must be males, and the grey dull-coloured birds either females or immature examples, or else that they belonged to totally distinct species; for the *Batrachostomi* exhibit two very distinct phases of plumage—the bright rufous or rufous bay (when adult), and the speckled, spotted, and striated grey and brown and rufous brown dress. So very different an aspect do individuals falling under either one or other of these two phases assume, that it was long before some authors suspected that they in fact belonged to the same species, though to the opposite sexes. This conclusion cannot even now be considered as placed beyond doubt (for the Frogmouths may be dimorphic); and it is therefore proposed to state and examine the evidence on which it rests. Bonaparte (Consp. i. p. 57. no. 2) seems to have been the first writer who announced that in the case of *B. javensis* the sexes differed; for he remarks (*l. c.*):—"Mas *et* fem. *inter se colore differunt uti* Scops asio *differt a* Sc. nævia *auctorum*." But his simile leads to the inference that he thought the rufous birds were males and the grey females. A few years later Prof. Schlegel (J. f. Orn. 1856, p. 460) propounded the general and more definite axiom that in all the Indian species of the genus *Podargus* (*Batrachostomus*) the males are grey, the females rust-coloured. At that time the Leyden Museum possessed examples of two Asiatic species, identified by the Professor as *B. parvulus* (*ex* Borneo and Malacca) and *B. cornutus* (*ex* Java, Sumatra, and Borneo); and to these species must Professor Schlegel's dictum be restricted, doubtless founded on numerous examples with the sexes determined by the Dutch collectors. Of *B. parvulus* (=*B. affinis*, Blyth), *ex* Malacca and Borneo or Sumatra, I have not met with an example, in either grey or rufous plumage, of which the sexes had been determined by a competent collector. Yet, if *B. affinis*, Blyth, is but a slightly smaller form of *B. castaneus*, Hume (of which there is little doubt), and consequently the rufous phase of *Otothrix hodgsoni*, then there is some confirmatory evidence of Prof. Schlegel's opinion that the grey birds belong to the male sex. Examples of *B. cornutus*, *ex* Sumatra and Borneo, in both plumages, with the sexes determined, fortunately exist in England, and bear out the Professor's conclusions. In the British Museum is preserved an example, *ex* Sumatra, in grey plumage, and marked as being of a male by its collector, Mr. Wallace. Count Salvadori (*l. c.*) describes a freckled rufous individual from Sarawak; and the sex, as ascertained by the collector, is stated to be female. Two pairs of this species, collected in Banjarmassing by Motley, were examined by Mr. Sclater; and he observed (P. Z. S. 1863, p. 212) that "the sexes are very different in colouring, the male being minutely freckled with brown and black, and the female bright rufous. Horsfield's figure represents the female." As regards the remaining Asiatic species there is also some evidence on this point. A bright rufous example

of *B. moniliger*, Layard, collected in Ceylon, by Mr. S. Chapman (*mus. nostr.*) is marked "sex, female." A grey-brown speckled bird of the same species, obtained at Ratnapura, in Ceylon, is marked ♂ by the collector, Mr. H. Nevil (*mus. nostr.*). Of two individuals belonging to the genus recently obtained in Travancore by Mr. Bourdillon, and referred by Mr. Hume (*l. c.*) to *B. moniliger*, Layard, one, in rufous plumage, said by Mr. Hume to agree with the description of the Ceylon type, is marked female by the collector; the other, in grey-and-brown freckled and mottled plumage, is marked a male. A single specimen of a new species from Mindanao, discovered by the naturalists of the 'Challenger' Expedition, is in rufous-brown striated plumage; and the sex is stated on the label to be female. Lieut. Wardlaw Ramsay ascertained the sex of a *Batrachostomus* obtained by him on the Karen hills (5000 ft. elevation) to be male; and this individual is in grey-and-brown mottled plumage, hardly distinguishable from the type of *Otothrix hodgsoni* and from grey-and-brown mottled examples of *B. affinis*, *ex* Malacca. Of *B. stellatus* (=*B. stictopterus*, Cab.) I have never seen examples in grey plumage. It is a common bird in Malaccan collections; and I have examined a great number of individuals. It has two phases of plumage—bright rufous or rufous bay, and dark brown and rufous brown. Younger birds possess either of these hues, but have the upper plumage striated. Count Salvadori's Latin description, taken from three Sarawak individuals (one of which is labelled as being a male), applies to the rufous-brown phase of dress; for he says, "*Supra rufo-brunneus.*" We might infer, therefore, that the bright rufous dress belongs here again to the female; but controverting this conclusion is a Bornean example in bright rufous plumage, collected by Mr. Everett (*mus. nostr.*), on the label of which the sex is marked male. Of ten examples of the large *B. auritus*, *ex* Malacca (*mus. nostr.*), five are in a rufous-coloured dress, and the other five are strongly tinged with grey above and below. I cannot discover that the sexes corresponding to these two phases of plumage have ever been determined by collectors; but Mr. Gould (*l. c.*) conjectured, some thirty-four years ago, that the rufous bird was the male, and the greyer bird was either the female or the young—a conjecture requiring confirmatory proof. With the exception of the male symbol on Mr. Everett's Bornean rufous example of *B. stellatus*, the little reliable evidence on record favours Professor Schlegel's generalization. It must not be omitted to notice that Mr. Hume (Str. F. ii. p. 349) has distinctly stated that "Mr. Hodgson's bird" (the type of *Otothrix hodgsoni*) "was certainly an adult female, by dissection;" but we are left without any evidence (besides Mr. Hume's statement) that this assertion is well founded; there is nothing on the label of the type specimen relating to the sex. Judging from the following more recent observation of Mr. Hume (*op. cit.* iv. p. 378)—"It is true that when I formerly wrote, I thought it (relying on what Hodgson recorded) probable that *hodgsoni* was the female, and *castaneus* the male,"—it would appear that Mr. Hodgson had *recorded* that he had *ascertained* by *dissection* that

the bird on which Gray founded his *Otothrix hodgsoni* was a female. If this be so, the conclusion that the females of this species are always rufous, and the males grey, is very much shaken; and it is most desirable that Mr. Hodgson's own words should be made known; for the accuracy of zoological facts stated by Mr. Hodgson may be said to be more than "probable." Of the specimens of *B. crinitus, ex* Gilolo and Batchian, with sex determined, the females are in rufous plumage or rufous brown (*B. psilopterus*). The females of other Papuan forms of *Podargus* appear also to be rufous, such as *P. ocellatus*. It may be added that the white markings on the nuchal, gular, and pectoral plumes and on the scapulars and wing-coverts (where they occur) are very similar in adult birds of either sex, *B. moniliger* in part excepted.

There is no evidence that the young, even nestlings, of both sexes wear plumage of the same colour. On the contrary, from the little that has been published on the subject, the young of the species known have grey or rufous predominating from the first.

Of the two nestlings from Darjeeling identified by Blyth as belonging to *B. affinis*, one is described as being "mainly of a light chestnut hue, with nearly obsolete barred markings, and throwing out deeper chestnut or light-bay feathers on the crown and shoulder of the wing; while the other is profusely mottled throughout with black on a pale ground, but faintly tinged with chestnut" (J. A. S. B. 1849, p. 806). The nestling obtained along with the adult of *Otothrix hodgsoni* (Mus. Brit.) is in pale rufous barred plumage. A nestling of the Travancore bird discovered by Mr. Bourdillon is described by Mr. Hume as a "little rufous brown ball" (Str. F. iv. p. 380).

If it comes to be established that the adult females wear the rufous dress, and the adult males the more sombre grey and brown plumage, we shall have the fact that the females of the species belonging to the genus *Batrachostomus* are far more brightly coloured, and therefore more conspicuous than the males. The white ornamental plumes, the erect, frontal, half-developed, crest-like feathers, the true occipital crests, and the long hair-like auriculars are equally prominent in adults of both sexes, species by species, the white scapulars in the *B.-auritus* group excepted. But the fact will remain that the bright colouring belongs to the females. It is a coincidence, though perhaps nothing more, that all seven were first made known from rufous examples.

The genus *Batrachostomus* was formed by Mr. Gould (Icones Av. ii. p. 13) for the reception of *P. auritus*, Vigors. Captain Hay three years later (J. A. S. B. 1841, p. 573) also proposed to make the same species the type of a genus which he called *Bombycistomus*. It is difficult to detect any external characters sufficiently definite to warrant the removal of *B. auritus*, or any of the other Asiatic *Batrachostomi*, from the older genus *Podargus*. Mr. G. R. Gray (P. Z. S. 1859, p. 101) created a separate genus under the title *Otothrix*, mainly relying on the long hairy auriculars, for the reception of the species obtained near Darjeeling by Mr. Hodgson. All

the external generic characters given by Mr. G. R. Gray for *Otothrix* belong to every other Asiatic species of *Batrachostomus* in a greater or lesser degree; and it seems unnecessary to retain the title. That of *Batrachostomus* I only hesitate to surrender because I have not had an opportunity of sufficiently studying all the species of *Podargus* as restricted. *B. crinitus*, if any species, perhaps deserves generic separation, on account of its long naked tarsus and weak bill.

The following diagnostic table may perhaps assist the identification of the species known to inhabit the Indian region.

Females, adult uniform rufous, young rufous much striated with brown. Males with mottled, freckled, spotted, striated, grey, brown, tawny, and rufous-brown plumage, or uniform brown upper plumage. A white or else tawny-white nuchal collar in adults of both sexes.

A. ♀. Wing-coverts unspotted with white. Gular collar, pectoral and scapulary plumes white.

♂. Wing-coverts with white or tawny white terminal spots or bands.

1. ♀. Major; white extending to centre of throat; gape 1·38 } *B. cornutus.*
♂. „ „ „ }
Sumatra, Borneo.

2. ♀. Minor; white extending to centre of throat; gape 1·12 } *B. javensis.*
♂. Undescribed ..... }
Java.

3. ♀. White throat, plumes confined to the gular collar; gape 1·12 ..... } *B. affinis.*
♂. White extending to centre of throat; gape 1·12..... }
Malacca, Burma, Darjeeling.

B. ♀. Wing-coverts with conspicuous terminal white spots. No white gular pectoral or abdominal plumes.

♂. „ „ „

4. ♀. Rufous; gape 1·31 ..... } *B. stellatus.*
♂. Brown or dark rufous-brown above; gape 1·31 ..... }
Malacca, Borneo, Sumatra.

C. ♀. Wing-coverts with conspicuous terminal white spots. White gular, pectoral, and abdominal plumes. Scapulars rufous.

♂. Wing-coverts, gular, pectoral, and abdominal plumes as in female.

5. ♀. Major; scapulars with large terminal black spots, tipped white; white gular and pectoral plumes rudimentary; feathers of the head mostly tipped fulvous; gape 2·25	*B. auritus.*
♂. Above and below tinged grey; scapulars tawny grey, finely striated with brown; gape 2·25	
Sumatra, Malacca, Borneo.	
6. ♀. Minor; scapulars without black and white terminal spots; gape 1·37	*B.* sp. nov.
♂. Unknown	
Mindanao.	
7. ♀. Scapulars with a minute terminal black dot, tipped white; gape 1·25	*B. moniliger.*
♂. Scapulars white and rufous white, minutely striated with brown; gape 1·25..	
Ceylon.	

Females, at least in some species, seem to betray immaturity by having their rufous plumage traversed by dark irregular striæ and by the white markings of the adult being ill-defined and not pure in colour; males by having the white nuchal and gular collar-plumes indistinct, undeveloped, and sullied by tawny. Some importance has been attached to the fact that in occasional examples of the genus the maxilla is found to overlap the mandibula. But this appearance seems to be owing to the imperfect preparation of the skin.

BATRACHOSTOMUS AFFINIS. (Plate XLV.)

Podargus stellatus, Gould, Blyth, J. A. S. B. 1845, p. 209.

Batrachostomus affinis, Blyth, J. A. S. B. 1847, p. 1180, "Malacca;" Blyth, *op. cit.* 1849, p. 806, juv.; *t. c.* p. 807, adult.

Podargus affinis, Blyth, Cat. Calc. Mus. p. 81. n. 405 (1849).

Batrachostomus parvulus (Temm.), Bp. Consp. Av. i. p. 57 (1850), ♀.

Podargus parvulus, Schlegel, J. für O. 1856, p. 460, "Borneo, Malacca;" Handleiding d. Dierk. i. p. 224, "Borneo, Malacca" (1857).

Otothrix hodgsoni, G. R. Gray, P. Z. S. 1859, p. 101, t. clii. (♀?).

Otothrix hodgsoni, G. R. Gray, Jerdon, B. India, i. p. 190 (1862).

Podargus javanensis, Horsf., Tickell, Indian Ornithology, vii. p. 8, *nec* Horsf.

Batrachostomus moniliger, Blyth, Tickell, *op. cit.* t. 1, "near Toung-ngoo, Burma," *nec* Blyth.

Batrachostomus castaneus, Hume, St. F. ii. p. 349 (1874), "neighbourhood of Darjeeling" (♀?); *op. cit.* 1876, p. 376.

Batrachostomus hodgsoni (G. R. Gray), Walden, J. A. S. B. 1875, pt. ii. ex. no. p. 83. no. 162, "Karen-nee, at 6000 feet," ♂.

Batrachostomus affinis, Blyth, Walden, *t. c.* p. 84.

Batrachostomus affinis, Blyth, Walden, Ibis, 1876, p. 355.

B. castaneus, Hume, Blanford, Ibis, 1877, p. 251.

Hab. Malacca, Burma, Darjeeling, Borneo (?), Sumatra (?)

B. parvulus is stated by Professor Schlegel (Handleid. *l. c.*) to inhabit Borneo and Malacca; but at page 479, index to the plates, no. 15, it is given as from Sumatra also. The bird represented, however, seems to belong to *B. stellatus*. An example of a young *Batrachostomus* (rufous plumage) is contained in the British Museum, and labelled "Sumatra," which may belong to *B. affinis*, as it corresponds well with the young example *ex* Malacca (*mus. nostr.*) below described. But the young bird in rufous plumage is exceedingly difficult to distinguish from the young bird of *B. cornutus* when the latter has not arrived at dimensions equal to or greater than *B. affinis* adult; and its resemblance to *B. javensis* will be probably found to be still closer.

Of the specific identity of *B. affinis* with *Otothrix hodgsoni* there is some concurrence of testimony. Fragments of two specimens from Darjeeling were enumerated by Blyth (Cat. Calc. Mus. no. 405, B, C) under *B. affimis*, but stated to be "of a nearly allied but distinct species." This opinion Blyth subsequently modified the same year; for in his "Supplemental note to the Catalogue" (J. A. S. B. 1849, p. 806. no. 405) he remarked, "In a collection made at Darjeeling we found the heads, wings, and tails of two specimens of what we now consider to be the young of this species" (*B. affinis*). Lieutenant Wardlaw Ramsay's example of *Otothrix hodgsoni* was obtained in the vicinity of the district from which Colonel Tickell received an example of *B. affinis* in rufous plumage. Malaccan examples of *B. affinis* in the dress of *Otothrix hodgsoni* occur as frequently as the rufous bird; and Mr. Hume (*l. c.*) has described a specimen of his *B. castaneus*, ex Darjeeling, in a plumage that agrees with that of *O. hodgsoni*. Mr. Hume almost admits that *B. castaneus* represents a phase or a sex of *O. hodgsoni*. Both Jerdon and Blyth in later years strongly suspected that *O. hodgsoni* represented a phase of *B. affinis*. In the dimensions of the wings and tail the birds at the northern limit of the range (Sikim) exceed those at the southern (Malacca), while the width of gape remains constant.

No. 1, ♀ (?) adult, ex Malacca (*mus. nostr.*) (Pl. XLV.). Head, elongated occipital crest-plumes, back, uropygium, upper tail-coverts, scapulars, minor and major wing-coverts, exposed upper surface of secondaries, and tertiaries, throat, sides of neck, breast, abdomen, ventral region, and flanks pure bright rufous; chin, forehead, and supercilium tawny rufous. The elongated auriculars tawny rufous and tipped blackish brown. The abdomen and exposed surface of secondaries and tertiaries of a somewhat paler shade than the back. Throat-plumes with a white open transverse V-mark towards the tips,

which are bright rufous; above the white mark a narrow dark brown line which separates the white of the V-mark from the white bases of the lateral webs, these forming a narrow white margin to the shaft, which is white; below the white V-mark another dark brown separating line, remainder of the webs grey or greyish brown: with each feather the extent and outline of the white markings slightly varies; but taken together a white irregular demicollar is formed, which is partly concealed by the rufous tips of its constituent feathers. Springing from below this collar and from the sides of the upper breast are many elongated bright rufous plumes, bearing a pure white ocellum about the middle of each. These ocelli are separated from the rufous colour of each feather by a narrow but distinct dark brown encircling line. Below these breast-feathers is another series traversing the lower breast and upper abdomen ornamented in a similar manner; but the spots are larger, and elongated rather than round, and on each side of the shaft above the drop the webs at their base are white; the white spots on the lower abdominal feathers are fewer in number, smaller in size, and more irregular in form. As on the throat, all these white markings are much concealed by the overlapping of the rufous tips and margins. Some of the scapulars have a long bold white centre, separated from the rufous by a narrow dark brown line. On the shorter scapulars the white mark is small; and on the longer scapulars the white only occupies the outer half of the feather. Several of the nuchal feathers are traversed by a pure white band, which is bounded above and below by a narrow dark brown line, the tips of the feathers being rufous. The unexposed inner webs of all the quills are uniform brown above, paler underneath. The outer webs of the primaries are pale rufous, with a few narrow transverse brown marks. Excepting the first and second primaries the pale rufous colour of the outer webs continues round the tips of the quills onto the inner webs, slightly increasing in extent with each quill. Underneath, the outer webs are also pale rufous, the brown marks hardly showing through. The shafts above are rufous brown, below pale rufous or yellowish rufous. The ground-colour of the rectrices is a dull rufous, of a somewhat darker hue than that of the tertiaries. They are traversed at almost equal intervals by a series of some seven or eight obscure ill-defined darker rufous or brownish-rufous bands, margined above and below by a narrow irregular zigzag darker brown line. On the outer rectrices these dark lines are broader, and the interspaces are darker brown. The basal half of the inner webs of the rectrices (middle pair excepted) is cut into with white or tawny white. The short outermost pair have a white or tawny spot on both webs and another higher up. The second outer pair have two tawny white marks on the outer web. Under surface of rectrices pallid rufous, the dark bands showing through. Under tail-coverts yellowish white, some tipped and otherwise marked with rufous. Thigh-coverts tawny. Axillaries grey tipped with rufous. Under wing-coverts mixed grey, rufous, and tawny white. The stiff elongated narial and frontal bristles are tawny rufous tipped black. The bill is massive and typical.

1st quill a little more than two-thirds the length of the 2nd, which is $\frac{3}{8}$ of an inch shorter than the 3rd; the 4th exceeds the 3rd by about $\frac{1}{8}$ and is slightly shorter than the 5th, which is longest. The tarsus is naked behind, but feathered anteriorly for about a quarter of its length. The three middle pairs of rectrices are about equal in length; the fourth pair are somewhat shorter; the fifth pair are about half the length; and the outer pair are almost rudimentary. Wing 4·62, tail 4·75, tarsus 0·43, middle toe 0·50, bill from forehead 0·88, width of gape 1·12.

No. 2, ♀ (?) not quite adult (?). Colonel Tickell (*l. c.*) described and figured a species of *Batrachostomus* from near Toung-ngoo, in Burma, which belongs to *B. affinis*. It is in rufous plumage, the feathers of the head, upper back, and scapulars being vermiculated transversely with black. No mention is made of a white nuchal band; nor is such a character indicated in the plate. Still this character might be easily overlooked in some skins; and Tickell described from a dried specimen. The description is of sufficient importance to be published, and is as follows:—"Iris sepia[1]. Bill fleshy horn. Legs horn. Head, upper back, and scapulars bright umber, shaded ferruginous on back and mingled with greyish on scapulars, the whole vermiculated crossways, black. Outer webs of two or three longest scapulars white, bordered with black. Tertials clouded brown, ferruginous and grey, with black vermiculations. Wing-coverts rusty vinous, broadly vermiculated black. Secondaries and primaries, outer webs chesnut-rusty, with broken narrow bars of black. Inner webs sepia. Tips of primaries pale and mottled. Tail cinnamon-brown, shaded grey marginally and vermiculated black, and crossed with five paler bars (not joining the shafts), subterminal series (*sic*). The bars are edged black and obscurely vermiculated. All underparts from bill vinous rusty, with a group of white black-margined patches on throat, and another across bottom of breast, below which the colour is paler and broken with rusty and dusky irregular bars; this extends to lower tail-coverts. Lower back and upper tail-coverts as back. A pale tawny supercilium. Lining of wings whitish. Length 9 inches. Wing 4–$\frac{3}{4}$. Tail 4$\frac{5}{8}$, of which beyond body 2$\frac{1}{2}$. Bill $\frac{5}{8}$. Tarsus $\frac{9}{16}$. Middle toe $\frac{5}{8}$."

This description refers to the rufous phase, when the upper plumage is traversed and vermiculated by narrow brown lines, while otherwise the bird exhibits the adult markings.

No. 3, ♀ (?) young, ex Malacca (*mus. nostr.*). Chin and upper throat tawny white; rest of throat tawny rufous, feathers tipped brighter rufous and with distinct indications of white ocelli. Upper breast the same. Lower breast-feathers tawny white, with rufous margins (somewhat as in *B. stellatus*, ♀ adult). No traces of the pure white drops on the lower pectoral plumes. Abdomen, ventral region, and under tail-coverts sordid white, with traces of pallid rufous. Frontal band and supercilium tawny rufous. Crown and occipital crest-plumes as in adult. White nuchal collar distinctly indicated,

[1] The colour of the iris must have been stated to, and not observed by, Colonel Tickell.

the white of the band not being pure. Back and uropygium dark rufous, traversed by narrow black irregular lines. Upper tail-coverts pale rufous, striated with black or brown. A few scapulars showing indications of the white markings of the adult. The rufous part of all the the quills with distinct, transverse, irregular black lines. Rectrices as in adult; but the paler rufous intervals are round, and do not touch the shafts. Sides of the neck creamy white. No lengthened auriculars. Wing 4·50, tail 4·12, bill from forehead 0·81, width of gape 0·88.

The example here described seems to be of a nestling female passing over to the intermediate finely striated phase. It is full of blood-feathers. An example, *ex* Sumatra (*Mus. Brit.*) is in similar plumage.

No. 4, ♂ (?) adult, Malacca (*mus. nostr.*). General aspect grey, greyish white, greyish rufous, rufous brown, with a white nuchal collar, white-marked scapulars, white throat and pectoral plumes. Frontal plumes tawny at their insertion, tipped and marked with brown, a bold buff supercilium, edged above with a series of buff feathers with brown tips and freckles. Crown-feathers greyish, with dark brown tips and small tawny-white marks on the margins of the webs of some. Lengthened auriculars tawny white the greater part of their length, freckled with brown, and tipped dark brown. Occipital crest like the crown-feathers, but tinged with rufous at their extremities, forming with the upper nape-feathers an obscure rufous-tinged collar. A conspicuous nuchal collar formed by a series of feathers which, pale rufous tawny grey at their insertion, are, lower down, traversed by a narrow brown zigzag line, then by a narrow band of pure tawny rufous, which is separated by a second irregular brown transverse line from a broad pure white band, which, in its turn, is bounded by a black terminal border to the feather, in some freckled with tawny. Interscapulars grey, with a rufous tinge, minutely freckled with brown, some with black, terminal small spots. Back the same, but less rufous, and with fewer black terminal dots. Upper tail-coverts rufous, with tawny dots and brown freckles. Some scapulars pure white, with a black terminal spot and a narrow margin (in parts) of black; near insertion a few zigzag pale brown markings. Several other scapulars with inner webs grey, freckled with brown, outer webs being pure white, narrowly bordered with dark brown, and having terminal black spots. Other scapulars pure white traversed sparsely with fine irregular greyish brown lines. Minor and major wing-coverts brown, with rusty margins and having a mottled rusty and brown aspect. Many of the major coverts with pure white terminal spots. White and tawny minute terminal spots on many of the other wing-coverts. Tertiaries brown, minutely freckled with pale grey wavy fine lines, tinged with tawny rufous in places. Some with white or greyish white terminal spots. Primaries with the inner webs pale brown; outer brown, marked with rusty and indented with white or tawny white. Tips of primaries (1st and 2nd excepted) mottled with tawny rust-colour. Axillaries grey, tipped pure white. Under wing-coverts creamy white, mingled here and there with brown.

Chin and throat-feathers white at their roots, with tawny tips, the produced hair-like shafts being brown, and narrow brown lines crossing some of the feathers. On the centre of the throat and reaching to the breast a patch of white feathers, each with a subterminal, irregular, brown, narrow transverse line, and in some, higher up the feather, a second V-shaped line. The white throat-plumes bordering the upper breast with a broader dark-brown or black terminal band. Separating the group of white throat-plumes from the upper breast is a series of brown feathers freckled with rusty, and all with more or less white along the basal half of the shaft. These are followed by a series of pectoral pure white plumes with either black terminal margins or black margins freckled with pale rusty. Many are traversed with two irregular brown narrow lines. These pectoral plumes are succeeded by pure white abdominal feathers, traversed by two narrow V-shaped pale-brown or tawny-brown lines, the terminal margins being white or fulvous. The flank-feathers have much the same character. The ventral feathers and under tail-coverts are white, some of the latter traversed with dilute brown markings. Rectrices pale grey, tinged tawny and profusely freckled with transverse, minute, irregular lines. Six or seven pale irregularly circumscribed quasi-bands cross the rectrices, but without quite touching the shafts. These bands are minutely dotted with pale brown, and margined above and below with a distinct brown line. Penultimate outer pair broadly indented on both webs with pure white. Shafts above pale ruddy brown, below tawny white. Rectrices below appear pale greyish brown, banded with pallid tawny. Rectrices tipped brown. The long narial bristles are black. The bill is as in the rufous bird. Upper fourth of anterior side of the tarsus is feathered. Wing 4·62, tail 5, tarsus 0·5, middle toe 0·62, bill from forehead 1, width of gape 1·12.

No. 5, ♂ (?) adult, ex Malacca (*mus. nostr.*). This example closely resembles the one above described, but has the plumage of the head of a darker brown. The whole back with a more decided dark rufous tinge. The pale caudal bands more regular in outline and running right across the feathers, and the darker and broader interspaces more rufous brown. Wing 4·75, tail 5, bill from forehead 0·9, width of gape 1·18.

No. 6, ♂ (?) not quite adult (?), ex Malacca (*mus. nostr.*). In general tone of colour this example closely resembles No. 4. The auricular plumes are fully developed, and the bill is that of an adult; but the white nuchal collar is only indicated by a few feathers, and might be overlooked. The scapulars exhibit white all over or only on the outer webs; the white on the throat-plumes is more irregularly distributed, while the pure white small spots on the major wing-coverts are more abundant. The rectrices resemble those of No. 2. Wing 4·5, tail 4·62, bill from forehead 0·9, width of gape 1·16.

An example (*mus. nostr.*) marked East Africa (!) only differs from the foregoing by all the quills being indentated on their outer webs with pure rufous without any white.

No. 7, ♂ (*fide* Wardlaw Ramsay) ex Karennee, at 6000 feet eleva-

tion (specimen referred to under the title of *Otothrix hodgsoni*, in Blyth's B. Burma, *l. c.*). This example has the general aspect of the three last described. The back has the rufous tinge of No. 5; but the white-banded nuchal feathers are not more apparent than in No. 6. The scapulars are coloured and marked as in the others; but on one or two of the tectrices, near the end, on either web, is a pure white spot. The white and the tawny rufous pectoral feathers are, here and there, tipped with a darker brown. The tail-feathers are marked as in examples 5 and 6; but the general tone is a shade more rufous or rusty. The markings on the quills are somewhat more rufous than in either of the Malaccan birds. On the whole it is impossible to discern any character which differentiates this example from the other three, more decided than the small differences that distinguish each of the three Malaccan individuals from one another. Some of the dimensions, however, are greater. Wing 5·0, tail 5·5, tarsus 0·62, middle toe 0·75, bill from forehead 0·93, width of gape 1·12. The graduation of the quills and rectrices is as in the others, and the tarsus as much, but not more feathered. The bill is as powerful. The iris is stated by Lieutenant W. Ramsay to be marbled buff, bill light madder, legs the same tinged with violet. The auricular plumes are not more developed than in Malaccan examples.

♂ No. 8, (?), neighbourhood of Darjeeling. Type of *Otothrix hodgsoni*, G. R. Gray. The whole of the feathers of the head are much darker brown than in the foregoing; each plume has a pair of fulvous subterminal spots, one on the outer margin of either web. These fulvous markings are very regular. Scapulars are all white or only so on the outer webs, some with broad black subterminal bands. Nuchal collar-plumes fulvous near the shaft, each terminated with a broad brown or black fringe, above which a broad white band, bounded by a narrow brown line. Dorsal plumage mixed rufous, brown, and black. Ground-colour of the caudal bands warm rufous and pale grey alternating, and all traversed with brown zigzag lines. The rufous bands are about double the breadth of the grey. The gular collar-plumes are white along the shaft; a brown transverse line, then a broad white band followed by a narrow brown terminal band fringed with fulvous. The most part of the pectoral and abdominal feathers are white with black subterminal triangular drops tipped white. Two outer pairs of rectrices indented with pure white on outer margin. Wing coverts brown with rufous marginal markings; greater coverts tipped with white drops. Wing 5·1, tail 5.3, gape 1·1. Tarsus covered anteriorally a quarter of its length.

No. 9, nestling. (Hodgson, *Mus. Brit.*). Above pale rufous, each feather with a subterminal straight brown transverse narrow band. White scapulars indicated. Below white, with a pale tawny brown transverse band on each feather. Gape 0·7.

BATRACHOSTOMUS CORNUTUS. (Plate XLVI.).

Podargus cornutus, Temm. Pl. Col. 159, "Bencoolen, Sumatra" (July 26, 1823).

Batrachostomus javensis (Horsf.), Sclater, P. Z. S. 1863, p. 211, "Banjarmassing, Borneo."

Batrachostomus javanensis (Horsf.), Salvadori, Ucc. Borneo, p. 112, ♀, "Sarawak" (1874); Walden, J. A. S. B. 1875, pt. ii. extra no. p. 84, "ex Sumatra."

Hab. Sumatra, Borneo.

Doria, according to Salvadori, *l. c.*, notes the iris of the female, ex Sarawak, as being light yellow (giallo chiaro).

In the British Museum is preserved an example of *B. cornutus*, in rufous plumage, from Banjarmassing, identical with an example obtained by Mr. Buxton in South-east Sumatra. The national collection also possesses examples from Sumatra, from Banjarmassing, and from Labuan, in grey spotted and striated plumage, which vary but slightly from one another. *Podargus cornutus* is the title substituted by Temminck for that of *P. javensis*, Horsf., in the belief that the Javan and Sumatran species were identical, on account of Horsfield's designation giving too restricted an idea of the geographical distribution of the species. The bird figured and described by Temminck (*l. c.*), however, is not in the absolute grey or mottled plumage of the male bird, but rather in the darker rufous-brown phase of the female, when the upper plumage is marked with fine narrow irregular transversal black markings. Dr. Jerdon (*l. c.*) treated *P. cornutus*, as figured in Shaw's General Zoology (xiii. pt. 2, p. 92, t. 41), as belonging to a species distinct from *B. javanensis*, Horsf. Shaw's engraving was copied from Temminck's plate (*l. c.*).

No. 1, ♀ (?) adult (?) ex Lampong district, S. E. Sumatra (*mus. nostr.*). General colour pale clear rufous, somewhat paler than in *B. affinis* ♀ adult, the description of which species will more or less apply to this kind in almost every respect but size. But the wings and tail are of a pale rufous-buff rather than rufous. The throat-feathers are nearly all white, and are without any transverse brown lines. Below they are bordered with a brown line, and then fringed with rufous. Many more of the pectoral feathers have white centres; and these are all more elongated than round on the upper breast. Most of the flank-feathers are largely centred with white, which does not seem to be the case in *B. affinis*, ex Malacca. The white markings, from being more numerous and larger, are much more conspicuous on the under surface than in *B. affinis*; and they reach to the vent. The greater wing-coverts are also faintly tipped with pale albescent dots. The elongated auricular plumes are rufous to the tips and not brown. Wing 5·50, tail 5·37, tarsus 0·68, middle toe 0·75, bill from forehead 1·12, width of gape 1·38. A few feathers on the anterior surface of tarsus.

No. 2, ♀ (?) adult, ex Banjarmassing (*Mus. Brit.*) closely resembles the Lampong female (?), but has the gular plumes differently marked. They are white on both sides of the shaft; an irregular transverse brown line crosses the feathers when the down ceases, followed by a white or fulvous white band, which is bordered below by a brown transverse line, below which is a broad white band finally margined

with brown. A few feathers on the tarsi. Wing 5·30, width of gape 1·30. Other dimensions as in Lampong example.

No. 3, ♀ (?) young, an immature example of *B. cornutus* in rufous dress, ex Banjarmassing, in the British Museum, is almost entirely of a pale isabelline-rufous, freckled with dark irregular transverse zigzag lines. Here and there, especially on the head, the uniform rufous feathers of the older stage have come in, and also a few of the white scapular, nuchal, and pectoral plumes. The mandibles are weak, evidently not full-grown; but the width of the gape is equal to that of *B. affinis* when adult, and the wing is longer than in that species, otherwise it would be difficult to determine to which species it belongs. Wings 5·10, tail 4·60, width of gape 1·10.

No. 4, ♂ (?) adult (?), ex Banjarmassing (Motley, *mus. nostr.*). (Pl. XLVI.) Were it not for the larger dimensions, a more massive bill, and a wider gape, it would be most difficult to distinguish this bird from males of *B. affinis* as above described. I am unable to state any feature of its plumage whereby it can be distinguished, other than its having a broad nuchal collar consisting of several tiers of plumes, fulvous-brown at their insertion, crossed by an obsolete brown line, then a fulvous band, followed by a parallel brown line, then a white band, bounded by a third brown line, then another white band edged on either side with a fulvous terminal fringe and tipped with a black drop. The upper plumes of the series want some of these details which characterize the lowest tier of feathers. The ground-colour of the rectrices is perhaps more rufous brown than pale grey, tinged with tawny as in *B. affinis*. Wing 5·25, tail 5·0, tarsus 0·65, middle toe 0·75, bill from forehead 1·12, width of gape 1·38. Tarsus naked. This and the following are the two males referred to by Mr. Sclater (*l. c.*).

No. 5, ♂ (?) adult, ex Banjarmassing (Motley, *Mus. Brit.*). Wing 5·20, gape 1·40, other dimensions as above; and the plumage offers no points of difference. Tarsus naked.

No. 6, ♂ (?) adult, ex Labuan (Lowe, *Mus. Brit.*). In this example there is scarcely a trace of rufous colouring. The colours of the plumage are brown, black, grey, and white. The colour of the rectrices is a pale grey, the dark transverse bands being formed by the greater number and density of the brown zigzag lines and markings. These bands are not all more or less parallel to one another, but narrow almost to a point inwards to the shaft. Wing 5·40, gape 1·35, Tarsus naked.

No. 7, ♂ adult, ex Sumatra (Wallace, *Mus. Brit.*). Has the general aspect of the Bornean examples and of those of *B. affinis* ♂. The wing-coverts are brown with rufous markings. The white nuchal collar-plumes are tipped with large black triangular drops. Pectoral plumes (other than the white) rufous lineated with brown. The caudal bands have alternately a grey ground and a rufous ground strangely contrasting, both traversed (but not unequally) with numerous zigzag brown lines. These bands are parallel. Wing 5·20, gape 1·35. Tarsus naked.

BATRACHOSTOMUS JAVENSIS.

Podargus javensis, Horsf. Tr. L. S. xiv. p. 141, "Java," (1820).

Podargus javanensis, Horsf. Zool. Res. Java (1830)[1].

Batrachostomus javanensis, Horsf., G. R. Gray, Gen. Birds, i. p. 45 (1846).

Batrachostomus javensis, Horsf., Blyth, J. A. S. B. 1847, p. 1680, partim.

Podargus javanensis, Horsf., Blyth, Cat. Calc. Mus. p. 81. no. 404, "ex Java," ♂ (1849); *conf.* Jerd. B. Ind. i. p. 190, sub *Otothrix hodgsoni*.

Batrachostomus javanensis, Horsf., Bp. Consp. i. p. 57 (1850) partim.

Batrachostomus javensis, Horsf., Moore, Cat. E.I. C. Mus. i. p. 112, "Java" (1854), type.

Podargus javanensis, vel *cornutus*, Schlegel, Handleid. d. Dierkunde, i. p. 224, "Java, Sumatra, Borneo" (1857), partim.

Batrachostomus javanensis, Bp., Bernstein, J. für O. 1860, p. 428, "Java."

Batrachostomus javanensis, Horsf., Walden, J. A. S. B. 1875, pt. ex. no. p. 84, "ex Java."

Hab. Java.

Bernstein (*l. c.*), who gives an account of the nesting of the Java bird, states that the iris is pure sulphur-yellow. Careful examinations of an authentic Javan example in rufous plumage (*mus. nostr.*), though lacking all the rectrices, has led me to doubt the specific identity of typical *B. javensis* with Sumatran and Bornean individuals. The bill, on comparison, is less massive, and the gape narrower. The dimension of the wing and tarsus are less. Horsfield's type specimen still exists, but in a deplorable condition, in the India Museum at South Kensington. With the exception of one or two broken rectrices and a few scattered plumes, the whole of the webs have been destroyed by the moth. Yet enough of the type remains to show that the width of the gape, the form of the bill, and the dimensions of the wing and tarsus agree with my authentic Javan example; and I feel therefore justified in separating the Sumatran and Bornean species from that inhabiting Java. Still they are but representative forms of one another, and along with *B. affinis* constitute a small characteristic group.

♀ (?) not in quite perfect plumage (?), ex Java (*mus. nostr.*). Bright rufous or chestnut. Lengthened auriculars brown for the greater part of their length. Frontal long imperfect plumes brown, almost black. A yellow, chestnut-tinged supercilium. Feathers before the eye pale rufous-yellow at base, with a transverse rufous or else brown line near the tips, which are bright rufous. A series of nuchal plumes pale rufous white, then an irregular transverse rufous brown narrow bar, followed by a broad white band, ter-

[1] This is the date on the titlepage of the complete work; but it is evident, from Temminck's remarks (Pl. Col. 159, sub *P. cornutus*), that the part, no. 2, in which the plate appeared must have been published in the year 1823, or earlier.

minated with rufous-brown. Shorter scapulars white-centred towards the end, the white being separated from the rufous edging by a brown mark. Longer scapulars with all the outer webs and a small part of the inner, near the shaft, white, which colour is more or less enclosed by a brown or rufous-brown irregular line, edged with rufous, inner webs rufous. Chin tawny rufous. A patch of feathers commencing at the middle of the throat, and expanding lower down the throat, pure white and rufous-white, each feather being traversed by an ill-defined narrow pale-brown line; a brown subterminal line fringed with rufous. Many of the concealed pectoral feathers marked in a similar manner, but without the transverse narrow line. Longer pectoral plumes whity brown, edged with a rufous fringe. Back and abdominal feathers paler rufous, centred with white, and with an outer white terminal double or single spot, or with outer webs only white. Ventral region pale tawny-rufous. Quills rufous-brown, outer webs pale rufous, with faint brown marking. Wing-coverts uniform chestnut-colour. Under wing-coverts pale rufous faintly barred with brown. Wing 4.85, tarsus 0·50, middle toes 0·68, bill from forehead 0·87, width of gape 1·12.

The tarsus is not feathered much below the knee; otherwise the structure is normal. In Horsfield's type the dimensions are, wing 5·75, tarsus 0·50, width of gape 1·12, bill from forehead 0·87.

The male has not been described, nor have I succeeded in meeting with an example; but if Prince Buonaparte had authentic Javan individuals before him, we may infer from the passage above quoted (*l. c.*) that it possesses the grey and brown mottled plumage of *B. cornutus* and *B. affinis*. Indeed, if the specimen in the Calcutta Museum, described by Dr. Jerdon (*l. c.*) really came from Java, there can be no doubt on the point. Dr. Jerdon even states that this specimen was "barely (if indeed at all) distinguishable from *Otothrix hodgsoni*." It may even be doubted whether *B. affinis* can be considered distinct from *B. javensis*; but there appears to be a discrepancy in the dimensions, and the white on the throat in *B. affinis* seems to be restricted to the gular collar.

BATRACHOSTOMUS STELLATUS. (Plate XLVII.)

Podargus stellatus, Gould, P. Z. S. 1837, p. 43, "Java" (?).

Batrachostomus javensis (Horsf.), Blyth, J. A. S. B. 1847, p. 1181, partim, nec Horsf.

Podargus javanensis, Horsf., Blyth, Cat. Calc. Mus. p. 81, no. 404 partim, "Avis juv. ex Malacca," nec Horsf. (1848).

Batrachostomus javanensis (Horsf.), Blyth, J. A. S. B. 1849, p. 807, nec Horsf.

Podargus parvulus, T., Schlegel, Handleid. d. Dierkunde, Atlas, t. ii. f. 15, "Sumatra" (1857).

Batrachostomus stictopterus, Cab. Mus. Hein. i. pt. ii. p. 124. no. 370, "Malacca," ♂ (1859–60).

Batrachostomus stellatus (Gould), Moore, Cat. E.I. C. Mus. i. p. 388, "Malacca" (1854); Sclater, P. Z. S. 1863, p. 212, "ex Malacca;" Salvadori, Ucc. Borneo, p. 113, "Sarawak," ♂ (1874).

Batrachostomus javanensis (Horsf.), Walden, J. A. S. B. 1875, pt. ii. ex. no. p. 84, partim, "ex Malacca, Borneo," nec Horsf., ♀.

Batrachostomus stictopterus, Cab. Walden, *l. c.* "ex Malacca, Borneo," ♂.

Batrachostomus affinis, Blyth, Hume, Str. F. 1876, p. 376, nec Blyth; Blanford, Ibis, 1877, p. 251, nec Blyth.

Hab. Malacca, Borneo, Sumatra, Java (?).

Mr. Everett has noted on the label of a rufous bird from Bedi, Borneo (*mus. nostr.*), and marked a male, that the iris is "light yellow," the feet ochre, and the bill pale brown. Doria (Salvad. *l. c.*) gives the colour of the iris of a Sarawak example as being light yellow (giallo chiaro).

The British Museum possesses a single specimen of this species in brown plumage, which is labelled "Sumatra." Its occurrence in that island is probable; but the correctness of the locality on the label is not beyond question; the skin is of the characteristic Malaccan make. The figure given by Professor Schlegel (*l. c.*) of *P. parvulus* undoubtedly represents *B. stictopterus*. It is stated to have been taken from an old male from Sumatra. The wing-coverts are spotted; and there are no white throat- or breast-markings.

The type of *P. stellatus*, Gould (Pl. XLVII.), now in my collection, is marked "Java" on the label. In the original description the length of the wing is stated to be four inches, whereas in the type specimen it is five. Beyond the word "Java" on the label, there is nothing to confirm its Javan origin. It has, however, no appearance of being a Malaccan trade-skin. Mr. Gould informs me that the prominent white spots on the major coverts suggested to him the specific designation of *stellatus*. The description of *B. stictopterus*, Cab., was taken from a Malaccan individual in the rufous-brown phase of plumage.

Without having the advantage of the observations of field collectors to assist us, it is difficult to select from a large series of this species any one example as illustrative of the adult bird. When compared with fully-plumaged rufous adults of the other species, the absence of their finished white markings and the decided coloration on the under plumage lead to the inference that *B. stellatus*, as it always seems to come to us from Malacca and Borneo, represents an intermediate stage of plumage. For long it was considered by several Indian writers, myself among the number, to be the young stage of *B. javanensis*, the pallid rufous-margined lower pectoral and abdominal feathers being very similar to what we find in *B. affinis* juv. Assuming that birds with the caudal bands complete, the chin and throat uniform rufous, and the back unfreckled are the most adult, I will describe the following example:—

♀ (?) adult (?), ex Malacca. General aspect above bright rufous. Frontal plumes tawny rufous, also supercilium. Crown, occipital crest-plumes, auriculars, cheeks, back, wing-coverts, and uropygium rich deep chestnut. A series of nuchal plumes grey at the insertion, lower down slightly tinged with rufous, then a narrow transverse blackish line, followed by a broader pure white band edged with

black, and then, in some, a rufous tip. A black-edged white nuchal collar is thus formed. The minor wing-coverts are unspotted ; but at the tips of the greater coverts are to be found a large white spot, mostly occupying the outer web and bordered above by a dark brown line. In some this dark line surrounds the inner margin of the white spot. Some of the scapulars have the greater part of both webs of the lower half white ; others have only the outer webs white. These white marks are all more or less edged with brown. The primaries and secondaries have their inner webs uniform brown, the outer webs being pale rufous with irregular rufous-brown marks at intervals, adjoining the shaft ; the exposed part of the tertiaries is more or less uniform rufous. The upper tail-coverts are rufous, with one or two pairs of tawny-rufous spots on transverse bars. Rectrices dull rufous, stippled with a few minute brown dots, and traversed by five or six narrow tawny-rufous bands, each being margined above and below with a narrow brown line. Terminal narrow fringe of rectrices dark brown, in some surrounded by a rufous edging ; in the laterals the pale bands on the inner webs are mostly almost white. Under surface of rectrices as above, but all tints much paler. Chin and throat dingy rufous, some of the throat-feathers and most of the upper pectoral having pallid tawny centres, most conspicuous on the breast, crossed by a pale brown line and fringed with bright rufous. This combination imparts a scale-like appearance to the breast, but has a slight resemblance to the pure white breast and throat-banding in *B. affinis* ♀. The lower pectoral feathers are of the same character, but, being much larger, more of the pallid tawny hue is exposed. The abdominal and flank-plumes are of the same pallid hue, but are scarcely fringed with bright rufous. The ventral region and under tail-coverts same as abdomen, but with still less rufous edgings. The narial bristles are tawny rufous, darker towards the tips. Under wing-coverts almost vinous tawny, varied with rufous or brown ; axillaries white. Wing 5·0, tail 5·25, tarsus 0·50, middle toe 0·63, bill from forehead 1·12, width of gape 1·31.

In some examples the nuchal collar-plumes have two transverse brown bars above the white. The white portion and, indeed, the whole of the markings also occur tinged with rufo-fulvous.

Mr. Gould's type specimen scarcely differs from the above description. Its rufous plumage is of a deeper bay tone ; the caudal bands do not touch the shaft, and they are rufous, and not tawny-rufous. This phase is to be found in Malaccan and Bornean examples. In less-mature (?) examples the dorsal plumage, the scapulars, the major coverts, and tertiaries are finely striated with black, with occasional more definite black lines.

♂ (?) adult (?), ex Malacca. In Malaccan collections examples are as frequently present in which the rufous or rufous-bay colouring is replaced by a dark brown tint, sometimes with a rufous tinge, the markings being similar to those of the rufous birds. The caudal bands or spots are sometimes of a rufous tint. These brown birds sometimes occur with the dorsal plumage finely striated with black

and mottled with dark rufous. Wing 5·0, tail 5·25, width of gape 1·31.

A Bornean (Bedi) example marked ♂ by Mr. Everett (*mus. nostr.*) is in the rufous-bay plumage, and is not distinguishable from Malaccan individuals (*mus. nostr.*). If the sex was correctly ascertained, it would appear that both sexes wear similar plumage. Wing 4·90, tail 5·0, width of gape 1·37.

In *B. stellatus* the auricular plumes are much less developed than in any of the other species. The front of the tarsus for about a quarter of its length is feathered. The bill is large and massive, and the gradation of the remiges and rectrices is normal.

BATRACHOSTOMUS AURITUS.

Podargus auritus, Vigors (Griffith), Tr. Cuv. An. Kingd. ii. p. 114, t. (1829); Vigors, App. Mem. Sir S. Raffles, p. 652, "Sumatra" (1830).

Batrachostomus auritus (Vigors), Gould, Ic. Av. pt. ii. p. 13, t. 7 (1838); Sharpe, P. Z. S. 1875, p. 99.

Bombycistomus fullertonii, Hay, J. A. S. B. 1841, p. 573, woodcut, "Sumatra,"

Podargus, sp. —, Blyth, J. A. S. B. 1842, p. 106, "Malacca."

Podargus fullertoni, Hay (?), Blyth, *t. c.* p. 798, "Malacca."

Hab. Sumatra, Malacca, Borneo.

The Malaccan bird has still to be compared with the typical Sumatran form. I have compared the Bornean example with the Malaccan, and can discern no distinction.

The species is too well known to require description.

The tarsus is well feathered anteriorly in both sexes for more than half its length.

BATRACHOSTOMUS, sp. n.

An example in rufous-brown mottled and striated plumage of an undescribed species of *Batrachostomus* was obtained in Mindanao by the 'Challenger' expedition. It is labelled a female, and will be described in my forthcoming report on the Philippine birds collected by the expedition. The tarsus is feathered anteriorly for a quarter of its length.

BATRACHOSTOMUS MONILIGER. (Plates XLVIII., XLIX.)

Batrachostomus moniliger, Layard, Blyth, J. A. S. B. 1849, p. 806, ♀, "Ceylon."

? *Podargus javanensis*, Horsf. Jerdon, Madr. J. L. Sc. nec Horsf.

? *Batrachostomus moniliger*, Blyth, Jerdon, B. India, i. p. 189, "Southern India" (1862).

Batrachostomus moniliger, Blyth, Holdsworth, P. Z. S. 1872, p. 420, "Ceylon."

Batrachostomus punctatus, Hume, Str. F. 1874, p. 354, ♂? "Ceylon;" *op. cit.* 1876, p. 377.

Batrachostomus moniliger, Layard, Walden, J. A. S. B. 1875, pt. ii. ex. no. p. 84.

Batrachostomus punctatus, Hume, Blanford, Ibis, 1877, p. 251, ex Ceylon.

? *Batrachostomus moniliger*, Layard, Hume, Str. F. iv. p. 376, "Travancore;" Blanford, *t. c.* 252.

Hab. Ceylon, Travancore.

Judging from Mr. Hume's detailed description (*l. c.*) of the specimen of a male obtained by Mr. Bourdillon in Travancore, the range of the Ceylon bird may be safely extended to that district of India. The iris of one of Mr. Bourdillon's specimens is stated to have been bright yellow.

No. 1, ♀, almost adult (?). (Pl. XLIX). Rattabown[1] or Kattabown, Ceylon (*mus. nostr.*). Bright rufous; of the same shade on the head and wing-coverts as *B. affinis* ♀, but elsewhere paler. Some stray rufous-brown feathers on the head and shoulders. Recurved frontal plumes tawny rufous. Feathers in front of the eyes tawny rufous, with a distinct brown subterminal transverse line or band and a narrow tawny-rufous terminal fringe. Behind these and passing over the eyes some longer feathers, black-tipped, with outer webs pale tawny-white, inner webs rufous, thus forming a pale supercilium. Long auriculars tipped brown. Four rows of nuchal feathers rufous, with a broad white subterminal band confined between a narrow irregular rufous-brown line above and below, the terminal fringe being rufous. In some of the nuchal plumes the markings are better-defined than in others, where they become obsolete. The whole presents the appearance of an irregularly formed white collar. Lesser wing-coverts unspotted, greater with bold, ovoid, larger or smaller white spots at their tips, mostly situated on the outer webs, and circumscribed more or less above and on their inner margins by a brown line. The scapulars are pure rufous, tipped by a minute white or fulvous spot, margined above with dark brown or black. The tertiaries are pale rufous, much freckled with brown, and having still minuter terminal spots of the same character as those on the scapulars. The primaries and secondaries have their inner webs brown and their outer pale rufous, the brown of the inner webs running through at intervals and forming narrow irregular bars. Many of the quills have minute terminal white spots; and all but the first have their tips clouded or freckled with rufous. The axillaries are rufous brown. Under wing-coverts pale rufous, with some grey and sandy white feathers. The chin is tawny rufous; the upper throat bright rufous, with no concealed white-marked plumes. Surrounding the lower throat a series of rufous plumes, broadly tipped with pure white, which is separated from the rufous above by a narrow irregular brown line; below, the white marks are faintly fringed with pale tawny. This white necklace is followed by the pure rufous of the upper breast, among which are no concealed white-marked feathers. Lower breast-feathers of the same rufous, but

[1] The writing on the label is most difficult to decipher.

more or less broadly tipped with white; an irregular narrow brown line separating the white from the rufous. This lower pectoral white band descends to the flanks. Abdominal feathers and under tail-coverts pale dingy rufous, mostly tipped with subdued whitish spots, surmounted by a narrow irregular brown line. The middle rectrices are pale rufous, much freckled with pale brown zig-zag lines and traversed by seven or eight obscurely defined dark brown bands; slight indications of white on the margins of the webs; laterals with the white indentations well marked, all tipped with a narrow white or rufous-white fringe, and a small subterminal black mark. Frontal bristles tawny-rufous and black-tipped. Wing 4·50, tail 4·50, tarsus 0·50, middle toe 0·63, bill from front 0·80, width of gape 1·25.

The bill is massive; the gradation of remiges and rectrices normal; the upper fourth of the exterior part of the tarsus is feathered.

No. 2, ♀ (?). Ceylon (*mus. nostr.*). General colour deep chestnut-bay or rufous-brown. This example differs by its deep tone of rufous from the last, which, while of a general bright chestnut, possesses a few feathers on the head and shoulders and all the axillaries of the deep shade of rufous found in this example. In both the distribution of the white markings is the same; but in the present one the white bars and the terminal rufous-brown fringes of the nuchal collar-plumes are more pronounced. The minute black and white terminal dots on the scapulars and tertiaries are less pronounced; there are fewer and less distinct brown markings on the rufous outer webs of the quills. The rectrices scarcely differ; but the under tail-coverts are more distinctly spotted. The feathers before the eye are darker, although also banded by a black line. Wing 4·50, tail 4·40, tarsus 0·60, middle toe 0·65, bill from forehead 0·81, width of gape 1·25. Structure as in No. 1.

No. 3, ♂ (*fide* Mr. H. Nevill), immature (?). Ratnapura, Ceylon (*mus. nostr.*). General aspect greyish brown, much mixed with rufous-brown. Chin and throat dingy pallid rusty; on the lower throat pure rufous feathers, with a broad white terminal band separated from the rusty colour by an irregular dark-brown line; no rufous or brown terminal fringe. Breast uniform rusty, with a few feathers on the sides, but not on the middle, broadly tipped with white and traversed with a zigzag brown separating line. Abdomen and flanks pallid fulvous-rusty, each feather for more than half of its terminal length greyish white, freckled with a number of minute irregular transverse brown lines; many tipped with minute whitish spots. Ventral feathers pallid fulvous-rusty, and only tipped with vermiculations; others and the under tail-coverts almost uniform fulvous-rusty, with pallid terminal spots and subterminal brown marks. Frontal feathers grey at insertion, freckled with brown, then rusty fulvous, with a subterminal black spot and a terminal minute rusty mark. Feathers of the head brown, with similar terminal marks. Superciliary plumes mostly rusty fulvous or buff on outer webs and brown on inner, with a black terminal dot, giving the supercilium a uniform buff appearance. Elongated auriculars rusty-tawny at base, freckled with brown, and pure brown at the

tips. Nape with a distinct rufous tinge; a few feathers on each side broadly terminated with white, which is margined above by a narrow brown line; a few feathers on the middle of the nape slightly tipped with pure white, some with fulvous. A rudimentary uncompleted nuchal collar is thus formed. Back and uropygium rufous-brown like the nape, marked with cloudy brown striations and a few black terminal dots. Upper tail-coverts rufous brown, with pale lateral subdued small spots or quasi-bands. Scapulars greyish white, much marked with irregular pale-brown striæ, tipped pale rufous, with a small terminal black spot almost encircling a minute rufous point. The lower scapulars are thus marked on the outer webs only, the inner being rufous, clouded with brown. Wing-coverts rufous brown. The major and secondary coverts purer rufous and tipped with bold round or ovoid white marks, some tawny, surrounded above and on their inner margins with black. Many of the greater coverts are traversed by brown zigzag lines; and the white tips are irregularly formed and incomplete. The quills are brown, the outer webs being indented with pale rufo-fulvous. The tertiaries brown, mottled with grey and rufous-grey, which resolves itself into more or less definite bands on the sides of the webs. Middle rectrices rufous-brown, with eight or nine pale fulvous-grey narrow transverse bands much dotted with brown; laterals brighter rufous. Under wing-coverts pale sordid fulvous grey. Wing 4·68, tail 4·50, tarsus 0·50, middle toe 0·75, bill from forehead 0·90, width of gape 1·20. Structure as in foregoing.

No. 4, ♂ (?) adult, Ceylon (*mus. nostr.*). (Pl. XLVIII.) General aspect above brown. Group of feathers before the eye pale rusty, with a dark brown subterminal bar; a narrow frontal band similarly marked. Superciliary plumes pale rusty white, mostly on the outer webs, freckled with brown on the inner and traversed with a subterminal dark brown irregular line. Feathers of the head brown, with minute fulvous terminal and marginal dots and subterminal black spots, all obsoletely freckled with fulvous, and many mixed with grey. Occipital crest-plumes without any fulvous dots. Elongated auriculars tawny, much striated with brown, and tipped almost black. Shorter auriculars tawny, with pale shafts. Nuchal plumes marked like occipital crest, but with a more tawny-rufous ground and with a subterminal white band confined between an upper and a terminal dark brown transverse line. A well-defined nuchal collar is thus formed of two or three rows of plumes. Interscapulars and back marked and coloured like the occipital crest. Uropygial plumes rusty, irregularly vermiculated with dark brown, some terminal markings being black. Upper tail-coverts the same, but with obsolete pale rusty lateral ocelli. Rectrices pale rusty fulvous, mixed with grey throughout, much vermiculated by fine irregular brown lines and with some seven or eight darker rufous transverse bands, separated from the paler by dark brown, almost black, irregular lines, these being broader and bolder than the fine vermiculations. Laterals with a brighter tawny rufous ground-colour. External short pair pale tawny-rufous, with pure white marginal spots. Undersurface of the rectrices pale ful-

vous or rusty brown, the black intermediate narrow bands showing through. Wing-coverts rufous brown, traversed with distinct dark-brown irregular lines. Some of the minor coverts with rusty-fulvous terminal spots. Many of the other wing-coverts with large ovoid pure white terminal spots, with a dark brown margin above and on their inner margins. Shorter scapulars with the inner webs fulvous or rusty, crossed by dark brown lines or narrow bars. Outer webs pale greyish white, crossed by fine zigzag brown lines and black terminal dots. Some of the longer the same, but with ill-defined white ocelli on their outer margins. Other long scapulars alike on both webs, pale rufous, much vermiculated with pale greyish-brown and with broad intervening incomplete bands of white or greyish-white. Quills dark brown, which runs at broad intervals through the pale rufous of the outer webs. Tips of the quills mottled with pale rufous. Tertiaries pale rufous or tawny-rufous, much striated with fine irregular brown lines; a bolder dark brown subterminal mark. Inner tertiaries obsoletely marked with four or five pale greyish white bands. Chin and throat rusty, with brown transverse lines. Some of the lateral feathers with a dark brown or black subterminal spot. Lower throat-plumes with terminal large pure white drops, margined above with a narrow dark brown line, thus forming a white necklace. Upper pectoral plumes like those of the chin and throat, but with subterminal dark brown marks and some admixture of grey in the ground-colour, some faintly tipped with greyish white, others with fulvous. Lower pectoral plumes pale fulvous-grey, with transverse dingy brown irregular lines, and broadly tipped with pure white, faintly edged with brown. Lower down these white-tipped plumes have a much more white than fulvous ground at the base. Abdominal feathers fulvous, terminated with white, and transversely striated with pale greyish brown. Ventral region and under tail-coverts fulvous-rusty, with obscure white terminal spots and subdued subterminal brown marks. Under wing-coverts the same. Axillaries dingy fulvous-grey, tipped almost white. Frontal rigid plumes and bristles black. Wing 4·75, tail 4·75, tarsus 0·50, middle toe 0·70, bill from forehead 0·90, width of gape 1·20.

Structure normal. Tarsus feathered anteriorly for a quarter of its length.

No. 5, ♂ (?), ex Malabar? (*Mus. Brit.*). This specimen is labelled Madras; but its mode of preparation is what we find in all west-coast trade skins. None of my Ceylon examples resemble it excepting in the white collars, scapulars, and pectoral plumes; and these last are not so prominent as in *B. moniliger* ♂, ex Ceylon.

General coloration mixed grey, fulvous, black, and white; only traces of pale rufous. Frontal plumes tawny at base, much vermiculated with brown and with black subterminal spots or bands. Feathers of the head and occipital crest pale ashy brown, many with black subterminal spots, and all tipped with very pale fulvous; equally pale fulvous spots on either web; others so marked and coloured, but without the black spots. Feathers comprising the nuchal collar tawny at base, with a few fine transverse irregular pale

brown striæ, succeeded by a broader brown mark and then a broad white band, tipped with black and margined with fulvous. Elongated auriculars tawny at base, traversed by numerous irregular fine pale brown lines and tipped dark brown. Space before the eye buff. A supercilium composed of buff feathers unstriated on outer webs, but lineated with brown on inner. Ear-coverts almost unmarked, pale ferruginous-buff. Shorter scapulars pure white, with several transverse zigzag brown lines, a black tip with a faint fulvous terminal dot. Inner webs of longer scapulars with a grey (not a white) ground; the inner web of others tawny-rufous, all lineated transversely with brown. Innermost tertiaries pale grey, with numerous transverse pale brown irregular lines and a terminal black mark. Back like the head. Uropygium brown, with fulvous transverse marks; no terminal black spots. Upper tail-coverts tawny-rufous, with a dark brown subterminal mark and a pallid tawny terminal dot. Ground-colour of middle pair of rectrices rufo-fulvous, much mottled with brown, towards apex grey, marked with brown and black. No distinct banding. Next pairs with bands more defined. Short outer pair pale ferruginous, with brown markings. Chin and throat pale fulvous, with fine transverse brown lines; some with broader brown subterminal marks and terminal almost white marks. A gular collar formed by broad pure white terminal bands to the lower throat-plumes, surmounted by a narrow brown intersecting line. The pectoral feathers, below this collar, pale brown, lineated as on the throat, and with faint albescent tips. Lower pectoral plumes pale fulvous, with broad white terminal halves much striated with dark brown. Abdominal plumes of the same character, but less striated and the white confined to the tips, bounded above by a brown line. Under tail-coverts pure pale rusty buff, with a subterminal pale brown line. Quills brown, much indented on outer webs with pallid tawny rufous, shading into almost pure white. Some of the inner primaries much mottled at apex, with grey or tawny rufous ground. Under wing-coverts pure tawny-rufous. Wing-coverts dark brown, traversed and tipped with rufous. Great stiff narial plumes black, with tawny specks at base. Wing 4·90, tail 3·50, tarsus 0·60, middle toe without nail 0·60, bill from forehead 0·80, gape 1·30.

This bird may represent a phase of Mr. Bourdillon's Travancore species, which is possibly distinct from the true *B. moniliger*.

EXPLANATION OF THE PLATES.

PLATE XLV.

Batrachostomus affinis ♀, No. 1, p. 427, from a skin from Malacca. *Mus. nostr.*

PLATE XLVI.

B. cornutus ♂, No. 4, p. 434, from a skin collected by A. R. Wallace at Banjarmassing. *Mus. nostr.*

PLATE XLVII.

B. stellatus ♀, p. 437, from Mr. Gould's typical specimen. *Mus. nostr.*

PLATE XLVIII.

B. moniliger ♂, No. 4, p. 442, from a skin from Ceylon. *Mus. nostr.*

PLATE XLIX.

B. moniliger ♀, No. 1, 440, from a skin collected at Rattabown, Ceylon. *Mus. nostr.*

3. On an undescribed Shrew from Central America

By EDWARD R. ALSTON, F.L.S., F.Z.S., &c.

[Received April 26, 1877.]

Among the Central-American Mammals in the British Museum are two shrews from Guatemala which were named but not described by the late Dr. Gray as *Corsira temlyas*[1], and are labelled and catalogued in the Museum as *C. teculyas*. A comparison with the other American *Soricidæ* convinces me that they represent an undescribed species; and Dr. Elliott Coues, who is at present at work on the American Insectivora, and to whom I have sent a short description of them, is of the same opinion. Dr. Günther, with his usual courtesy, has had the skull extracted from one of the specimens; so that I am able to describe the dentition of the species, which proves to belong to the restricted genus (or subgenus) *Sorex*, characterized by the possession of thirty-two teeth in all. In describing these I have accepted the views of Dr. E. Brandt as to the homologies of the teeth in this family[2].

As neither of Gray's names has any claim to adoption, and as both are barbarous, I propose to call this Shrew

SOREX VERÆ-PACIS, sp. n.

Corsira temlyas, J. E. Gray, P. Z. S. 1843, p. 79 (sine descr.).
C. teculyas ejusd. MS.

Ears moderate, thickly clothed with rather long fur. Tail rather long, clad with short closely pressed hairs which conceal the scales.

Colour nearly uniform dark dusky brown, hardly lighter beneath, feet and tail dusky. Fur short and close, dark slate-colour at the base, tipped with dark brown.

Approximate measurements from the mounted type specimens:—

	inches.	inches.
Length of head and body	3·45	3·35
,, tail	2·05	2·00
,, hind foot	·53	·50

Teeth white, tipped with brown. First upper incisor stout, falcate, with a well-marked internal cusp; second to fourth simple, gradually diminishing in size, canine slightly smaller than fourth incisor. Premolar very small, hardly higher than the cingulum of the first molar.

[1] P. Z. S. 1843, p. 79.

[2] "Izslyedovaniya o zubnoi sistemye kutor i zemleroek," St. Petersburg, 1865 (cf. Zool. Rec. 1866, pp. 24–27); "Untersuchungen über das Gebiss der Spitzmäuse," Bull. Soc. Imp. Nat. Moscou, vol. xli. (2de p.) pp. 76–95, pls. i.–vi., vol. xlvi. (2de pt.) pp. 1–79.

Molars with the usual W pattern towards the outer edge and broad low inner portion, which in the second and third rises into a distinct cusp.

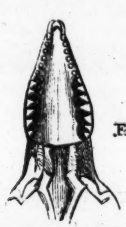


Fig. 3.

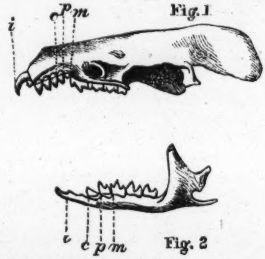


Fig. 1

Fig. 2

Skull and dentition of *Sorex veræ-pacis*.

The lower incisor is long and stout, with one well-marked and one nearly obsolete internal cusp. The canine is small and simple; and the premolar and molars have each one inner and two outer cusps.

Hab. Coban (Vera Paz), Guatemala (*Brit. Mus.*).

I may here observe that the Shrew named *Corsira tropicalis* by Gray, at the same time as the above, seems to be the same as that subsequently described as *Sorex micrurus* by Mr. Tomes[1]. Dr. Coues informs me that it proves to belong to the division of *Blarina*, which have thirty-two teeth; but whether it is distinct from some of the described North-American species remains to be ascertained.

These Central-American Shrews are interesting as showing how far the Insectivora have penetrated into the Neotropical Region, their further advance having doubtless been checked by the competition of the smaller Edentates and Marsupials.

As all the Guatemalan Mammals named without description by Gray in the Society's 'Proceedings' for 1843 (p, 79) have now been determined, I add a list with their synonyms:—

1. *Heteromys desmarestianus* = *H. desmarestianus*, Gray, P. Z. S. 1868, p. 204.
2. *Corsira tropicalis* = *Blarina micrura* (Tomes): *cf. suprà.*
3. *Corsira temlyas* = *Sorex veræ-pacis*, Alston: *cf. suprà.*
4. *Saccophorus guochil* = *Geomys hispidus*, Leconte: *cf.* Coues, Proc. Acad. Philad. 1875, p. 133.
5. *Mus tazamaca* = *Ochetodon mexicana* (De Sauss.): *cf.* Alston, P. Z. S. 1876, p. 756.
6. *Mus teguina* = *Hesperomys teguina*, Alston, P. Z. S. 1876, p. 755.

[1] P. Z. S. 1861, p. 279.

4. Notes on the Anatomy of Passerine Birds.—Part II. By A. H. Garrod, M.A., F.R.S., Prosector to the Society.

[Received April 30, 1877.]

In my former communication on the anatomy of the Passeres[1] I adopted a definition of the group in which was included the important character made known by C. J. Sundevall in 1831, and expressed in the 1872 edition of his valuable 'Methodi naturalis Avium disponendarum Tentamen' in the following words:—"Hallux . . . . . per se mobilis. Musculus enim *flexor hallucis longus* articulum ejus ultimum flectens, a flexore digitorum communi perfecte solutus. (In avibus reliquis, omnibus, tendo hujus musculi cum tendinibus alterius conjungitur. Hallux igitur simul cum reliquis digitis semper flectitur.)" *Upupa epops*, agreeing with the Passeres in this respect, is by the author included with them. As mentioned in my paper on the deep plantar tendons of birds[2], I have so frequently been able to verify this statement of the Swedish naturalist, that I felt justified in making the fact part of my definition of the group. Recently, however, from skins which have been placed at my disposal by Mr. Salvin, I have found reason for overthrowing the character, because in the Eurylæmidæ there is a strong vinculum which joins the two muscles exactly in the same manner as in many of the non-passerine families.

Eurylæmus ochromelas, *Cymbirhynchus macrorhynchus*, and *Calyptomena viridis* are the species which I have examined (more than one specimen of each); and in all of them there is a narrow but strong vinculum, situated just above the metatarso-phalangeal articulations, and running from the tendon of the *flexor hallucis longus* downwards to the tendon of the *flexor digitorum profundus*. No other passerine bird which I have dissected possesses this vinculum, not even *Rupicola crocea*, which has been thought by some to be intimately related to the Eurylæminæ. Such being the case, either Sundevall's character no longer holds, or the Eurylæmidæ are not Passeres.

In his invaluable memoir on the voice-organs of Passerine birds[3], a translation of which, by my friend Mr. F. J. Bell, will shortly be published at Oxford (by the Clarendon Press), J. Müller was so overcome by the flood of facts which he had discovered, that he remarks "It is, then, now thoroughly proved that the singing birds cannot be separated, as an order, from the rest of the Passeres (of Cuvier). There is only a large division of *Insessores* or Passerines which must also include the *Scansores*. This order of *Insessores* will contain birds with the most varied supply of vocal muscles, as well as birds which do not possess these muscles, every intermediate condition being found." The fact that an important generalization, such as that of Sundevall above considered, breaks

[1] P. Z. S. 1876, p. 508. [2] P. Z. S. 1875, p. 348.
[3] Abh. k. Akademie d. Wiss. zu Berlin, 1847.

down in the case of *Eurylæmus* would have further confirmed Müller in his views, and makes the question as to the ordinal importance of the Passerine group one of vital ornithological interest.

My subclass Anomalogonatæ[1] very closely corresponds with the Müllerian "Insessores," which comprises the Cuvierian order so termed, together with the Scansores. At the present time its importance would be considered supraordinal by all; and it is not customary now to divide that large division into three sections, 1. *Oscines*, 2. *Tracheophonæ*, 3. *Picarii*, as was done, though not with any great feeling of certainty, by the able German biologist. We include the Oscines and Tracheophonæ, together with the "Ampelidæ and Tyrannidæ," in the order PASSERES. Why do we do so? For many reasons.

First, because, since the promulgation of the theory of natural selection by Mr. Darwin, the doctrine of evolution has obtained a hold upon biologists. This doctrine makes us look upon the classification of animals and plants in a different aspect to that in which the biologists of thirty years ago and more were wont to do. We do not expect to find all intermediate links between any two allied forms of life. Groups have become differentiated from their parent stocks, and when once independent have gone on developing in their special lines, without admixture with any other types. When the ancestral Passeres were first developed they possessed the potentiality for the production of all the peculiarities of their offspring; and the peculiarities which made them Passerine must form the fundamental basis for a definition of the group. The determination of what these fundamental characters happened to be can be only made at the present time (as far as soft parts are concerned, at least) by a correlation of the non-varying details. No Passerine bird being otherwise, they probably had (1) the hallux alone of all the toes directed backwards, (2) short, simple colic cæca, (3) a nude oil-gland, together with the special pterylosis of the group, (4) only one carotid artery, the left, (5) a sternum with a single notch on each side of the carina, together with a bifurcate manubrium, (6) a truncated vomer with the anterior angles of which the nasal cartilages joined, (7) a peculiar insertion to the *tensor patagii brevis* muscle of the wing.

As in all but the Eurylaimidæ, the deep flexor tendon of the hallux is free from that to the other digits of the foot, at the same time that the Eurylaimidæ agree with by far the majority of the class Aves in this respect (whilst in the characterizing features above stated they are completely Passerine), it is evident that the ancestral type which forms the basis of our definition, lived at a period prior to the loss of the vinculum between the pedal deep flexor tendons, because the probability that the vinculum may have reappeared in them in a condition identical with that in other birds is infinitely small. This view is confirmed by the nature of the syrinx, as far as we are acquainted with it, J. Müller not having been able to detect any intrinsic muscles in *Corydon sumatranus*[2], the only species he had the

[1] P. Z. S. 1874, p. 111. [2] *Loc. cit.* p. 32.

opportunity of examining. And the length of the first primary among the remiges tells the same tale.

The order Passeres falls, therefore, into two sections to start with :— those with the hallux not free, the Eurylaimidæ; and those with the hallux independently movable. This latter suborder may be again divided up in the manner suggested in Part I. of this communication[1]. I much regret that, not having been able, as yet, to obtain any of the Eurylaimidæ in spirit, I have not had an opportunity of making out the arrangement of the *tensor patagii brevis* muscle at its insertion. From skins, however, I have been able to procure the skulls, with the palates uninjured, of *Eurylæmus ochromelas*, *Cymbirhynchus macrorhynchus*, and *Calyptomena viridis*. The first and last of these are figured here (figs. 1 & 2), *Cymbirhynchus* agreeing very closely with *Eurylæmus*. The truly Passerine

Fig. 1.



Fig. 2.



Fig. 1. Palatal view of skull of *Eurylæmus ochromelas*.
Fig. 2. Palatal view of skull of *Calyptomena viridis*.

nature of the vomer at its anterior end, with the alinasal cartilages ossified in connexion with them, is undoubted; at the same time the more than usually transverse and lengthy maxillo-palatines with their unexpanded knobbed ends are worthy of notice. *Calyptomena* is seen to resemble the other genera in this latter point, though the vomer is much narrower throughout. The feeble development of the postero-external or "transpalatine" portions of the palatine bones, as termed by Mr. Parker, is to be seen in both the genera.

Turning to a different subject, I desire to direct attention to a peculiarity in the skulls of some of the Dendrocolaptidæ among the Tracheophone Passeres, which has, in my opinion, some significance in the arrangement of the genera of that family.

From an examination of *Furnarius rufus*, *Leptasthenura ægithaloides*, *Synallaxis frontalis*, *Sclerurus caudacutus*, and *Phlœocryptes melanops*, I find that these birds present features in the conformation of their nasal bones not present in *Conopophaga aurita*, *Dendro-*

[1] P. Z. S. 1876, p. 518.

colaptes albicollis, *Picolaptes affinis*, *Thamnophilus murinus*, *Thamnophilus doliatus*, *Thamnomanes glaucus*, *Grallaria guatemalensis*, *Hylactes megapodius*, *Pteroptochus albicollis*, or any other Passerine bird with which I am acquainted. They are, in fact, schizorhinal, like the Charadriiformes; in other words, the osseous external nares are in the form of triangular openings, the apical angle of each of the triangles being situated between the inner and outer process of the nasal bone of the corresponding side[1]. Figure 3 gives a view of the

Fig. 3.



Superior surface of skull of *Furnarius rufus*, to show the schizorhinal form.

upper surface of the skull of *Furnarius rufus*. It has been my habit to group all the birds possessing the schizorhinal skull in a single major division, including the restricted Limicolæ, the Gruidæ, Laridæ, Alcidæ, and the Columbidæ; but the independent development of an identical disposition in the small division of the Passerine birds above mentioned weakens the importance of the character to a certain extent, although it is not at all necessary to assume that it overthrows its significance. Collateral evidence, from visceral and other details, compels me still to think that those schizorhinal birds which possess the ambiens muscle—or are, in other words, homalogonatous[2]—must be retained in one great order, the Charadriiformes, until some important structural differences are discovered which necessitate their being otherwise arranged. The schizorhinal disposition is most certainly one which is a secondary development upon the normal holorhinal nares; and that it has been independently arrived at in two non-related orders of the class is proof that it results from most simple causes, because the probability that the same complex conformation should appear *de novo* varies inversely as the complexity: the greater the elaborateness the less the chance that it, in all its detail, comes into existence more than once. A still more simple variation is found in the number of the carotid arteries, the normal two being reduced to the left only in certain members of

[1] *Vide* P. Z. S. 1873, p. 33. [2] *Vide* P. Z. S. 1874, p. 116.

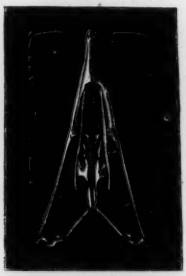
almost every order—in *Rhea* and the Megapodes among the Galliformes, in *Arctica alle* and *Turnix* among the Charadriiformes, in *Sula fusca* and *Plotus anhinga* among the Ciconiiformes, &c. The disappearance here and there of the ambiens muscle and of the femorocaudal, as well as of the colic cæca, all come under the same category, as simple operations which lose their significance in the determination of affinity in proportion to the frequency of their appearance, or to the facility with which they are induced, as I would assume.

The figure of the superior surface of the skull of *Furnarius rufus* (p. 450), when compared with those of Charadriiform birds in my paper above quoted[1], will show the resemblance between the two, as far as the point under discussion is concerned.

In questions of doubtful affinity among the birds under consideration, this character proves to be of service. For example, the genus *Margaronis* is differently placed by leading ornithologists—by some along with the Sclerurinæ on account of the shortness of its outer toe, by others with the Dendrocolaptinæ because of the stiffness of its tail-feathers. From the skull, an example of which I have had the opportunity of removing from a skin of *Megarornis perlata*, through the kindness of Mr. Salvin, I feel no doubt that it is *not* Dendrocolaptine, because the nasal bones agree exactly with those of *Furnarius rufus* and the other schizorhinal Passeres above mentioned.

I may also mention that in these schizorhinal tracheophone Passeres, as also in their allies the Pteroptochidæ, the maxillo-pala-

Fig. 4.



Palatal view of skull of *Pteroptochus albicollis*.

tine plates of the maxillary bones, instead of terminating by blunt uncurved tips, as in the non-oscine (mesomyodian[2]) Passeres generally, including *Dendrocolaptes*, *Thamnophilus*, and their nearest allies, are slender and curved backwards as in the Oscines. A study of the superb plates in Mr. Parker's Memoir on Ægithognathous Birds[3] will illustrate this point, which an inspection of other skulls

[1] P. Z. S. 1873, p. 34.
[2] P. Z. S. 1876.
[3] Trans. Zool. Soc. vol. ix. p. 289, pl. lvi. figs. 8–10, lvii. figs. 8–10, et lix. figs. 1–3 & 6–8.

still further verifies. Figure 4 (p. 451) shows this formation in the palate of *Pteroptochus albicollis*.

These facts, when correlated, suggest a slight modification of the arrangement of the Tracheophonæ as based upon the nature of the tarsal scutellation and the structure of the tails. In their valuable 'Nomenclator Avium Neotropicalium,' Messrs. Sclater and Salvin divide the suborder thus:—

Suborder TRACHEOPHONÆ.

Fam. 1. *Dendrocolaptidæ*.

Subfam. 1. Furnariinæ.
Subfam. 2. Sclerurinæ.
Subfam. 3. Synallaxinæ.
Subfam. 4. Philydorinæ.
Subfam. 5. Dendrocolaptinæ.

Fam. 2. *Formicariidæ*.

Fam. 3. *Pteroptochidæ*.

To me it would appear that the following arrangement better represents their mutual alliances:—

Suborder TRACHEOPHONÆ.

Fam. 1. *Furnariidæ*.

Subfam. 1. Furnariinæ.
Subfam. 2. Sclerurinæ.
Subfam. 3. Synallaxinæ.
Subfam. 4. Philydorinæ.

Fam. 2. *Pteroptochidæ*.

Fam. 3. *Dendrocolaptidæ*.

Fam. 4. *Conopophagidæ*.

Fam. 5. *Formicariidæ*.

5. On the past and present Geographical Distribution of the Larger Mammals of South Africa[1]. By T. E. BUCKLEY, B.A., F.Z.S.

[Received April 30, 1877.]

Since my last communication to the Society on the Geographical Distribution of South-African Mammals (P. Z. S. 1876, p. 277), I have again visited South Africa, and have gathered some further information on the subject; and the following are the additions and corrections I wish to make to my former paper.

Professor Newton, a short time ago, kindly showed me a letter he had received from Mr. E. L. Layard, in which Mr. Layard criticised

[1] Continued from P. Z. S. 1876, p. 277.

some of my statements, and made a number of additions to the localities for certain species in the Cape colony. These I have incorporated into my paper *verbatim*, with his name attached to the extracts, except in instances when I had gathered the same information for myself; in such cases I did not think it necessary to do this.

ELEPHAS AFRICANUS (the Elephant), *l. c.* p. 280.

Besides the Knysna, the Elephant is still found in some of the other large forests of the eastern provinces of the Cape colony, one of the spots being the Addo bush, near Port Elizabeth. My informant told me that their spoor was frequently seen while the railway was being made, but that the animals apparently disliked to cross the line itself. In the Amatonga country, in a spot south of Delagoa Bay and east of the Bombo hills, there is a small herd preserved by the chief Nosingili; I am told, however, that they are for the most part tuskless and very fierce, which, I believe, is generally the case when they are without those appendages: from here they sometimes cross the Bombo, and wander, in summer, through the plains underneath these hills to places where the "Umganu" tree is common, to feed on its fruit, which is about the size of a plum, and of which the Elephants are extremely fond.

In 1875 an Elephant was killed in Umsila's country, north of Delagoa Bay, with tusks weighing 150 lb. each, which, I believe, is the largest pair ever known.

EQUUS QUAGGA (the Quagga), *l. c.* p. 281.

Mr. Layard, in his letter, makes the following remark on my statement as to the extinction of this the true Quagga:—"He is, I think, wrong. We had a young Quagga (true) in the S.A. Museum; and I several times saw skins for sale in Cape Town, mutilated and unfit for mounting. I forget the locality whence they came, but think it was somewhere from the S.W. Chapman and Andersson both spoke to me of it; but I have not my books to refer to."

In the Table at the end of my former paper, p. 291, there is a misprint relating to this animal, "the extensive plains north of the Vaal river;" *south* should be substituted for *north*.

EQUUS MONTANUS (the Zebra), *l. c.* p. 282.

Mr. Layard gives another locality for this species. He says, "It was not extinct in 1868, *to my personal knowledge*. It existed in small troops in the Hottentot Holland mountains near Fransch Hock, not far from Cape Town. I *know*, in 1864, it was in the Swartbergen, between George and the Beaufort Karroo; I hunted it there along with the Kudu, though unsuccessfully. Buckley, in P.Z.S. 1876, p. 282, says, 'It was still said to occur in the Hottentot Holland mountains.' I heard of it on the mountains to the eastward, Zuurberg &c."

CEPHALOPHUS GRIMMIA (the Duiker) *l. c.* p. 283.

I was not aware, until Sir Victor Brooke informed me, that there

was more than one species of Duiker; so that the remarks in my former paper can only refer to the eastern variety. Mr. Layard seems to consider that there is another species still, besides the eastern form and that of the Cape colony, which comes from Ovampoland. He thus characterizes them:—"The Eastern form is grey, with a rufous dash between the horns and down the front and nose; the Western form is all grey, and a different grey from the Eastern; the colonial one is rufous (chestnut), with a dark, almost black, dash down the face, and a tuft of twisted hair between the horns. I am not sure that the others have this." In both my specimens, however, from Matabililand the tuft of twisted hair between the horns exists.

ÆPYCEROS MELAMPUS (the Pallah), *l. c.* p. 283.

The Pallah was at one time pretty common in suitable places in the north of Natal; and even yet, I am informed, a small herd of from eight to a dozen individuals exists on the Mooi river, near its junction with the Tuglea, where they are now preserved.

STREPSICEROS KUDU (the Koodoo), *l. c.* p. 284.

Concerning the existence of the Koodoo in the Cape colony, Mr. Layard says:—"In 1864 the Koodoo was an undoubted inhabitant of the Swartbergen before noted, to my personal knowledge; also I heard of it in the forests of Zitzikama, Fish river, and other forests to the eastward. Buckley seems to doubt its still being in the colony."

In the 'Cape Monthly Magazine' for November 1875, Gough and the northern part of Bushmanland in the Cape colony are given as localities for this species.

ALCELAPHUS CAAMA (the Hartebeest), *l. c.* p. 285.

The same gentleman who showed me the Gemsbock's head, told me that a few Hartebeests were to be found in the same place as the Oryx; and, if I remember rightly, he had brought with him a pair of their horns from that locality. Mr. Layard says that the Hartebeest still lingered in the Beaufort Karoo, between Nelspoort and the Zwartberg in 1864. In Natal I saw a fine herd of these Antelopes, close to Pietermaritzburg, in September of last year, also a small herd of eight or nine on the Biggareberg.

ALCELAPHUS LICHTENSTEINI?, *l. c.* p. 286.

This species of Hartebeest is found along the coast, commencing about 24° S. lat., and goes along to the mouth of the Limpopo. It is again found far inland at Shesheke, a town on the north side of the Zambesi, and a little west (about forty miles) of where the Chobi and Zambesi join. A friend of mine who had just come down from that place kindly presented me with two pairs of horns, male and female. On showing them to a Mr. Du Bois, with whom I was just about to start on a hunting-expedition, he at once recognized them as the horns of a Hartebeest he had seen some distance north

of Delagoa Bay, and called them by the native name of "Nondo." Speke and Grant found them common in Central Africa, in several localities; they are apparently local, as they have not been observed at the Victoria Falls of the Zambesi. The horns of this species are a good deal smaller than those of *A. caama*, and are very much flattened at the base.

In the 'Cape Monthly Magazine' for November 1875, this species of Hartebeest is apparently mentioned under the name of Maak Hartebeest, and the coast district between the Limpopo and Zambesi is given as one of its habitats.

CONNOCHETES GNU (the Common Gnu), *l. c.* p. 286.

According to the November number of the 'Cape Monthly Magazine,' a small herd of this animal is preserved on one of the large farms in Victoria, West division, in the Cape colony.

In the Table at the end of my former paper, p. 272, under this heading, "south" must be substituted for "north;" and the same mistake occurs also lower down, under the heading *Hippotragus equinus*.

ORYX CAPENSIS (the Gemsbock), *l. c.* p. 289.

Mr. Layard corrects a statement of mine, to the effect that the Gemsbock is found at Cape L'Agulhaz; this it appears is not so, as he himself knows the country about there well, and has hunted all over it.

While at Cape Town I met with a gentleman who had just returned from Little Namaqua Land, where he had been successful enough to shoot a male Oryx; and he kindly showed me its head. This is now probably the only place in the Cape colony where this species exists. I have been told, too, that the Oryx is found in the north-eastern part of the Transvaal, and sparingly north of Delagoa Bay. The Hon. W. H. Drummond, in his book on the Large Game of South and South-east Africa, mentions the Gemsbock as occurring a little to the north of the Sutu river, in Amaswazi Land; this would be a little north of 27° south latitude, and 32° east longitude.

BUBALUS CAFFER (Cape Buffalo), *l. c.* p. 289.

While I was at the Cape, waiting for the steamer to take me onto Natal, I heard of a man who was going down to the Knysna to try and shoot Buffalo there; and in Mr. Layard's letter, he says that the Buffalo "was certainly still found in the Knysna and all the great forests of the eastern provinces up to the date of my leaving the Cape in 1870."

In Natal, besides the herd mentioned in my paper, I have since been informed that a few are still supposed to exist on the range of hills between Natal and Moschesh's country, where the Umkomazi and the Umzinkulu rivers rise: this is one of the wildest and least-known parts of that colony.

In the 'Cape Monthly Magazine' for November 1874, a writer on Antelopes states that "a remnant still roams through the Tzitzikama forest."

Mr. Du Bois, with whom I was hunting last season in the Amaswazi country, and who knows that part of Africa perhaps better than any other man, informs me that a variety of the Buffalo, smaller and with a red tinge on its skin, used to exist along the Bomba hills; and in fact I saw such a skin brought in for sale by one of the natives. The Hon. W. H. Drummond, in his book on the Large Game of South-eastern Africa, says, p. 33, "A herd of Buffalo, or, more correctly speaking, several herds, that exist in a district known as the Umbeka, on the north-east of Zululand, are famed as having a tinge of red in their colour, and as being smaller and more dangerous than any others."

June 5, 1877.

Prof. W. H. Flower, F.R.S., V.P., in the Chair.

The following papers were read:—

1. Description of five new Species of Sponges discovered by A. B. Meyer on the Philippine Islands and New Guinea. By the late J. S. Bowerbank, F.R.S., F.Z.S.[1]

[Received May 14, 1876.]

1. Ophlitospongia meyeri, sp. nov.

Sponge fistulous; pedicel short and stout. Surface very rugged and tuberculous. Oscula numerous, dispersed within the cloacal cavity. Pores inconspicuous. Dermal membrane spiculous; tension-spicula acuate, dispersed or subfasciculate, large and stout, same size as those of the skeleton; retentive spicula bidentate equianchorate, very minute and slender, denticuli long, apices obtuse, few in number, dispersed. Skeleton: Fibre rigid, stout and abundantly spiculous; rete irregular and open; spicula acuate, and a few acerate, stout and rather long; fibres profusely armed with stout attenuato-acuate basally and apically spined internal defensive spicula, projected at nearly right angles and in all directions from the fibres. Interstitial membranes spiculous; spicula same as those of the dermal membrane. Gemmules membranous, spherical or oval, black and opaque.

[1] Communicated to the Secretary by Dr. A. B. Meyer, with the subjoined remarks:—

"The enclosed paper of the late Dr. Bowerbank on five new sponges from the Philippines and New Guinea was finished June 1876, and was intended by the author for the 'Proceedings' of the Zoological Society. He sent the paper over to me for inspection; and I returned it, after having added a few notes. He then became ill and died, without having been able to forward the paper to your address. Dr. Bowerbank's family now return the paper to me, and I forward it to you with the hope that the Society may accept it."

Colour, in the dried state, nut-brown.

Hab. Kordo, Island of Mysore, Geelvinks Bay, New Guinea (*Dr. A. B. Meyer*).

Examined in the dried state.

Type in the Dresden Museum.

Dr. Meyer observes :—" In life, of the gayest green, red, and yellow colours, which fade away very quickly.

The form of this sponge is that of a single long fistulous body which has apparently been attached to the side of a mass of calcareous matter by a short stout pedicel, and has then curved upwards to about eight inches in height. Its external diameter rather exceeds two inches; and its internal one averages one and a half inch. Externally it is very rugged and prominently tuberculous, while its inner surface is smooth and even, with numerous dispersed oscula for discharging their effete streams into the large cloacal cavity, which exceeds seven inches in depth.

The oscula within the great cloacal cavity are numerous, and appear to be equally distributed throughout the whole of its length; they rarely exceed a line in diameter.

The external surface of the sponge abounds in porous cavities or depressions; but the true inhalant pores of the dermal membrane that lines them are inconspicuous, and I did not detect a single open one on any part of the dermal membrane when mounted in Canada balsam. The dermal membrane is abundantly spiculous. The tension-spicula are acuate, stout and long, and as large as those of the skeleton; they are dispersed or subfasciculated; occasionally, but rarely, a few of the attenuato-acuate internal defensive spicula occur among them; but I could not detect any acerate spicula. The bidentate equianchorate retentive spicula are very slender and minute, their denticuli are long and obtusely terminated; they vary greatly in size, the smallest ones frequently not exceeding half the size of the larger ones. The largest I found measured $\frac{1}{1500}$ inch in length; of the smaller ones, one measured $\frac{1}{2727}$ inch, and another $\frac{1}{3000}$ inch in length. The fibre of the dermal rete is not so abundantly spiculous as that of the skeleton. The latter frequently assumes quite the appearance of a *Desmacidon* from the abundance of its spicula.

The skeleton-spicula are of two forms, acuate and acerate, the latter form being of rather rare occurrence; both forms are rather variable in length: they are very numerous and closely packed in the fibres; their average length is $\frac{1}{187}$ inch.

The internal defensive spicula are based on the surface of the skeleton-fibre, from which they are projected at various angles. Their bases and the distal halves of their shafts are abundantly spinous, the proximal half of the shaft being frequently destitute of spines; these organs are well developed and are all acutely conical. The internal defensive spicula are very numerous, and they form a most effective defence against any minute Annelids that might attempt to enter the skelton structures of the sponge. Their average length is $\frac{1}{300}$ inch.

The interstitial membranes closely resemble the dermal one, but

they are not so abundantly furnished with tension-spicula, while the retentive ones are the same in form and about the same in number. These organs are not very readily detected *in situ* while immersed in the sarcode; and from the delicacy of their structure they require a microscopical power of at least $\frac{1}{1000}$ linear to render them distinctly to the eye.

The gemmules of the sponge are rather numerous on the interstitial membranes, and on the inner surface of the dermal one. They are smooth, spherical or slightly oval, and opaque and black, whether viewed by direct day-light, or, when mounted in Canada balsam, by transmitted light. They vary to some extent in size: the smallest of them measured $\frac{1}{3000}$ inch in diameter, the largest $\frac{1}{1360}$ inch; but the average of several measured was $\frac{1}{1500}$ inch in diameter.

2. ISODICTYA ASPERA, sp. nov.

Sponge sessile, multifistulous, fistulæ branching irregularly and usually confluent; parietes thick; surface very rough and irregular. Oscula within the fistulæ. Pores inconspicuous. Dermal membrane spiculous, reticulated; rete irregular, uni- or bispiculous; spicula acuate, same size as those of the skeleton. Skeleton: Rete irregular, diffused; primary fibres multispiculous, secondary fibres irregularly disposed; acuate, stout and rather long. Gemmules membranous, abundant, more or less congregated, spherical, semitransparent, dark amber-colour.

Colour. In the dried state, dark brown.
Hab. Abu, Philippine Islands (*Dr. A. B. Meyer*).
Examined in the dried state.

Type in the Dresden Museum.

This sponge rather exceeds six inches in height, and is of about the same average diameter.

The fistulæ radiate in all directions from the massive basal attachment, and immediately separate more or less into short stout branches which most frequently become confluent groups. This character of the fistulæ is very unusual, and is very characteristic of the species. The surfaces of the fistulæ are exceedingly rough and rugged; and their substance is very brittle in the dried state. Their distal terminations are open to the full extent of their internal diameters; and their margins are thin. The oscula on the smooth inner surfaces of these organs are distinctly visible by the aid of a lens of about two inches focus.

Portions of the dermal membrane, when mounted in Canada balsam; and viewed with a linear power of about 100, exhibit its reticular structure in a very satisfactory manner; the rete is rather irregular, but very distinctly exhibited; it is most frequently unispiculous; but occasionally two or, rarely, three spicula are combined in some parts of it. The spicula are nearly equal in size and of one form only, rather long and stout acuate. In a portion of the dermal membrane thus examined, there were a considerable number of groups of gemmules, each group consisting of numerous closely

packed specimens, very uniform in their colour and degree of semi-transparency. These organs varied in diameter from $\frac{1}{500}$ to $\frac{1}{1000}$ inch. Some of these groups of gemmules consisted almost entirely of the larger forms, while in others they were nearly all of the smaller description. They require a linear power of about 300 to render them distinctly to the eye. I have never before seen a similar congregating of the gemmules in any sponge that I have examined.

The general structure of the skeleton is very irregular, the rete in some parts being composed of many more spicula than in others. The spicula of which it is constructed are of the same form and size as those of the dermis. The gemmules were also dispersed singly around the rete to which they were attached; and in size and general character they were in perfect accordance with those grouped on the inner surface of the dermal membrane.

This sponge is the only specimen I have seen of the species; and although its structural characters are exceedingly simple, its external ones are so remarkable, that it cannot well be confounded with any other known species of *Isodictya*.

Polyfibrospongia, genus novum.

Skeleton kerato-fibrous. Fibres solid, cylindrical, aspiculous. Rete symmetrical. Skeleton-lines polyfibrous; primary lines of the skeleton radiating from the base of the sponge to the distal margin; secondary lines disposed at nearly right angles to the primary ones.

Although nearly allied in many respects to the genus *Spongionella*, there is an important difference in the structural arrangement of the skeleton-fibres of this sponge as compared with those of the type forms of *Spongionella pulchella*, which distinctly separates them. In the latter genus the skeleton-structures, both primary and secondary, are composed of single fibres; the primary ones radiating from the base of the sponge, and the secondary fibres being disposed at right angles to the primary ones. This mode of skeleton-structure prevails also in the sponge from the Philippine Islands; but instead of single fibres thus disposed, we find continuous fasciculi, each composed of numerous slender fibres in both the primary and secondary portions of the skeleton-structures. Thus, although the individual fibres of the sponge are very nearly the same as in *Spongionella*, the congregation of the fibres in large diffuse fasciculi constitute an important generic difference; and I therefore propose to make this peculiar mode of skeleton-structure the type of a distinct genus, to be designated as above.

3. Polyfibrospongia flabellifera, sp. nov.

Sponge fan-shaped, pedicel very short, parietes very thin, surface smooth and even. Oscula and pores inconspicuous. Dermal membrane aspiculous, but abundantly supplied with adherent extraneous matters. Skeleton: Primary lines composed of a loosely constructed polyfibrous cord of slender anastomosing keratose fibres; secondary lines constructed the same as those of the primary series;

both series abundantly laden with externally adherent particles of extraneous matters.

Colour. In the dried state, light ochreous yellow.

Hab. Geelvinks Bay, New Guinea (*Dr. A. B. Meyer*).

Examined in the dried state.

Type in the Dresden Museum.

Dr. Meyer observes, "in life brown."

The form of this sponge is that of a contorted fan six inches high by eight and a quarter inches broad. It is based on a short massive pedicel. The thickness of the general expansion of the sponge does not at any part exceed one twelfth of an inch; and the general construction of the skeleton is visible to the unassisted eye. It has lost a great part of its dermal membrane; but considerable portions of it still remain. It is destitute of any spicula usually characteristic of dermal tissues; but it is abundantly supplied by adhesion with adventitious spicula of other sponges and of grains of sand and other such matters. The oscula are scarcely distinguishable; they appear to consist of minute orifices rarely exceeding the size of one of the areas of the skeleton-rete, and they are very irregularly distributed over the inner or concave surface of the contorted sponge. I could not detect any pores in a portion of the dermis mounted in Canada balsam.

The loosely constructed polyfibrous lines of the skeleton are very singular in their structure. They consist of numerous minute fibres, running nearly parallel to each other, and anastomosing at irregular intervals by short connecting fibres at nearly right angles to each other. Neither the primary nor the secondary lines ever appear to be in any degree twisted. The primary lines, on an average, measured $\frac{1}{94}$ inch in diameter, and the minute fibres of which they are composed varied frem $\frac{1}{2143}$ to $\frac{1}{1394}$ inch in diameter.

The interior of the sponge appears to be as abundantly supplied with adherent grains of sand and other adventitious substances as the dermal membrane is; but none of such substances were embedded in the keratose fibres of the sponge as in the genera *Halispongia* or *Dysidea*.

4. HALISPONGIA STELLIFERA, sp. nov.

4. Sponge cup-shaped, compressed, parietes thin, pedicel short. Surface even and smooth. Oscula small, slightly raised on low tumid elevations, few in number. Dermal membrane pellucid, aspiculous, but abundantly supplied with adherent extraneous matters. Pores disposed in areas containing from one to two or three of them, each surrounded by numerous minute radiating fibres anastomosing near the pore, but diverging separately towards their distal terminations. Skeleton: Primary lines radiating in nearly parallel lines from the base to the distal margin; secondary lines anastomosing irregularly with the primary ones. Primary and secondary lines both polyfibrous; fibres solid, cylindrical, frequently anastomosing irregularly. Gemmules minute, spherical, dark and opaque.

Colour. In the dried state, grey ochreous yellow.
Hab. Geelvinks Bay, New Guinea (*Dr. A. B. Meyer*).
Examined in the dried state.

Type in the Dresden Museum.
Dr. Meyer observes, "in life brown."

The form of this sponge is that of a closely compressed cup with a considerable complication of parietes on one side; and it does not appear as if it had been more expanded when in the living condition. It is one foot in height and the same at its greatest expansion, and the pedicel is short and stout. When covered by the dermal membrane, the surface both within and without the cup is smooth and even. Near the base of the sponge there are a few oscular orifices slightly elevated on tumid masses; but these organs are inconspicuous on the more fully expanded parts of the sponge. When a portion of the dermal membrane, mounted in Canada balsam, was examined by transmitted light with a power of 200 linear, the porous areas seen were large and well defined; they contain usually one, but occasionally two or three pores, each of which is surrounded by a beautifully regular and very extensive series of apparently minute corrugated radiating lines; some of these pores are open, while others are completely closed. With a higher power this apparent corrugation is seen to consist of minute slender transparent fibres which freely anastomose with each other in the immediate neighbourhood of the pores; but subsequently they diverge freely to a very considerable distance from the pore without anastomosing with each other.

The skeleton is decidedly that of a *Halispongia*. The primary or radial fibres are amply supplied with the usual central lines of embedded grains of sand and other extraneous substances, and more especially so at the surfaces of the sponge. A few adventitious spicula of various sizes and forms are entangled amid the skeleton-fibres, to which also numerous dark opaque spherical gemmules are attached, varying in diameter from $\frac{1}{1000}$ to $\frac{1}{1875}$ inch in diameter.

The most striking specific characters in this species of sponge are undoubtedly those of the dermal membrane; and it must be observed that they are very difficult to find without the aid of mounting portions of the dermis in Canada balsam; and from the extreme delicacy of the radial lines surrounding the pores, powers of from 200 to 500 linear are required to render them distinctly to the eye of the observer.

5. HYALONEMA ANOMALUM, sp. nov.

Sponge expansively cup-shaped, sessile (?) Surface smooth. Oscula on the inner or exhalant surface, simple, large and numerous. Pores dispersed, inconspicuous. Dermal system expansible; connecting spicula expando-quaternate; radii and shaft attenuating, large and strong. Dermal membrane aspiculous (?). Skeleton: Cup compressed (?), fasciculated, fasciculi loosely compacted; spicula cylindrical, with clavate or thyrsiform terminations incipiently

spinous, very long and slender, and often flexuous, intermingled with single spicula of the same form and size irregularly dispersed. Interstitial spicula varying from cruciform to rectangulated sexradiate, radii cylindrical, incipiently spinous, numerous. Retentive spicula minute sexradiate stellate, radii bi- or trifurcate, attenuated, immersed in the sarcode, very numerous.

Colour, in the dried state, very pale grey.
Hab. Cebu (*Dr. A. B. Meyer*).
Examined in the dried state.

Type in the Dresden Museum.

If one adopts the rule that I have followed in all my previous descriptions of sponges, that the structure and mode of arrangement of the materials composing the skeletons of the Spongiadæ are the legitimate source of their generic characters, this sponge is decidedly a *Hyalonema*, but without the so-called glass rope. This organ in *Hyalonema* is not really a portion of the essential skeleton, but is rather an appendage thereto, and is apparently of the nature of a cloacal organ. Entertaining these views, I have, in accordance with them, referred the sponge in course of description to the genus *Hyalonema*; and from its discrepant structure I have given to it the specific name of *H. anomalum*. The interstitial spicula of both species also agree in being cruciform, with spinous cylindrical radii; and in each their forms are more or less variable in the number of the radii, and in both they are numerously dispersed amid the interstitial structures.

This sponge is $3\frac{1}{2}$ inches in height and 2 inches in width at its distal extremity. In its present state it is somewhat compressed. It has no part of its basal attachment remaining; and it was in this condition apparently when taken from the sea; and from the very small remains of sarcode amid the skeleton-structures it was most probably at that time a dead specimen. What remains of the sarcode of the interstitial membranes is nearly translucent, and occurs in detached masses, each of which is crowded with the minute sexradiate stellate retentive spicula.

The dermal system is furnished with numerous large expando-quaternate connecting spicula, the radial shaft being attenuated. Their mode of arrangement is similar in design to those of *Alcyoncellum speciosum* and *Rossella philippensis*; but their disposition does not appear to be so regular as in either of those species.

The dermal membrane has been nearly all destroyed. A few small portions, in a tolerably good state of preservation, were found on parts of the margin of the cup; and these were spiculous. I found also a small piece of the external dermal membrane *in situ* in a tolerably good state of preservation; and on this there were a few large simple porous orifices irregularly dispersed. This portion of the membrane appeared to be rather abundantly supplied with very minute attenuato-acuate defensive spicula; and intermixed with them a few sexradiate stellate retentive ones were dispersed. The membrane is very thin and delicate in its structure, and it was coated

with sarcode, which appeared to be in a partially decomposed condition.

The skeleton-structure, like that of the spongious base of *Hyalonema mirabile*, is composed of irregularly dispersed fasciculi of long spicula; but the fasciculi are less compact in their structure, and amid them there are numerous single spicula as irregularly dispersed as the fasciculi are. The form of the skeleton-spicula in the sponge in course of description is very long, slender, cylindrical, with incipiently spinous clavate terminations; and intermixed with them there are a few very large and stout acuate ones. The best view of the skeleton-structure is to be seen in portions of the sponge from the inner surface of the cup. At this surface the dermal membrane appears to be aspiculous; but immediately beneath it, in the portion examined, there were numerous groups of sexradiate stellate retentive and defensive spicula, densely packed in detached masses of sarcode. This congregation of spicula in separate masses is probably due to the partial decomposition of a uniform stratum of sarcode in the living sponge in which these minute organs abounded. The sexradiate stellate spicula are exceedingly slender, and average $\frac{1}{1000}$ inch in extreme expansion. They appear to vary considerably in the number of their furcating spicula—some radii being trifurcate, while others are bifurcate; and very few have the full number of the furcating radii.

The interstitial spaces of the skeleton are abundantly supplied with cruciform spicula with cylindrical incipiently spinous radii. The normal form of these spicula is evidently rectangulated sexradiate. The greater number of them are cruciform; but a considerable number have the fifth ray, or basal portion of the shaft; and a few of them are completely sexradiate. There is a very great difference in size between the two sets of spicula—those appropriated to the dermal system with attenuated radii, and the smaller and much more abundant ones of the interstitial spaces with cylindrical radii, the expansion of the radii of the dermal ones averaging $\frac{1}{23}$ inch, while those of the interstitial spaces seldom exceed $\frac{1}{128}$ inch in the expansion of the cruciform radii.

The minute attenuato-acuate spicula, which are numerously dispersed on the interstitial membranes, average about $\frac{1}{2000}$ inch in length; and it appears probable that they are really the radiating spicula broken off from the very numerous sexradiate stellate spicula that are crowded together in such great numbers in the interstitial masses of sarcode. The skeleton-spicula are many of them flexuous; their average length is $\frac{1}{25}$ inch, while the diameter of a fully developed one measured only $\frac{1}{6000}$ inch.

The loosely arranged fasciculi of the skeleton-structures of this sponge seem to closely ally it to the spongious base of *Hyalonema mirabile*; while the physiological structure of its expansile dermal system with its quaternate connecting spicula, and, to a considerable extent, its anatomical structure, are in perfect harmony with the corresponding parts of the genera *Alcyoncellum*, *Rossella* and *Geodia*; and the minute rectangulated sexradiate stellate forms of retentive

and defensive spicula are common to several species of *Geodia*, *Farrea*, and to *Alcyoncellum* as well as to this sponge.

If the term hexactinellid, as used by some writers, be adopted as designating the series of sponges which contain the various forms of rectangulate sexradiate spicula, it will embrace a number of genera and species widely differing in the important distinctive characters of their skeletons, upon which the most important characters of their classification must ultimately be founded.

June 8th, 1876.

2. Remarks on the exact Localities of some Birds from the Islands of the South Pacific. By E. L. Layard, F.Z.S.

[Received May 14, 1877.]

In speaking of "the geographical distribution of the Fruit-pigeons in the numerous islands of the Pacific" (P. Z. S. 1874, p. 94), Dr. Finsch has, I think, committed an error which it will be as well to point out. I have only just obtained my back numbers of the 'Proceedings,' or would have alluded to the matter at an earlier date. Late though it is, I know Dr. Finsch will thank me for assisting him with local knowledge to propagate the truth, an end at which I am sure we both aim.

Dr. Finsch says, "*Ptilinopus fasciatus*, Peale, is found on the Feejees, Navigators', and the small island of Uea of the Wallis group." I think, as regards the Navigators' Islands, he is certainly mistaken. The *Ptilinopus* found there is certainly distinct, whatever it is. I have not *original* descriptions to which to refer; but my idea is (taken from Finsch and Hartlaub's own work, and from the plate in the Mus. Godeffroy) that it is *P. apicalis*, Bp. In one of my late communications to this Society (see P. Z. S. 1876, p. 495) I have pointed out the differences, which are constant. The bird which I call *P. apicalis* is never found on Fiji, nor is the Fijian bird which I call *P. fasciatus* ever found in the Navigators'. Tonga has its own species, which I call *P. porphyraceus*; and it, again, is found, or a *very near approach* to it, on Fotuna Island. *P. fasciatus* is found on Viti Levu, Mang-o, and Wakaia Islands.

I must now point out another error into which my friend Dr. Finsch has fallen. He says, "the beautiful *Chrysœna victor*, Gould, is confined to Taviumi[1], one of the smallest islands of the Feejee group." So far from Taviuni being one of the "smallest," it is actually one of the *four largest* islands of the group; and *C. victor* is *not* "confined" to it, but distributed all over the large island of Vanua Levu, and the islands of Rambi, Lanthala, and Kamea. I may add, however, to Dr. Finsch's remarks, that my new *Chrysœna* (*C. viridis*) is, so far as yet known, confined to the island of Kandavu.

[1] I spell this as Dr. Finsch has done. Unlucky island! how naturalists have misnamed it! Both in the 'Proceedings' and in 'The Ibis' it has been spelt half a dozen different ways; but the correct way is Taviuni.—E. L. L.

I see also Dr. Finsch alludes, in the 'Ornithologie der Viti-, Samoa- und Tonga-Inseln,' to *Myiagra castaneiventris* being found in Samoa. Will he kindly inform us on what authority he does this? as neither Mr. Whitmee, Mr. Krauss (Messrs. Godeffroy's collector there), nor myself could ever find it there, and we all doubt its existence on the group. Will Dr. Finsch, who writes as if he had specimens before him from the Navigators', tell us who procured them, when, and where? My impression is that some Fijian specimens have been accidentally mixed by the collector with *M. albiventris*, the only *Myiagra* we have ever found in Samoa.

3. Note on two African Cuckoos of the Genus *Coccystes*. By E. L. Layard, C.M.G., F.Z.S., &c. &c., H.B.M. Consul in New Caledonia.

[Received May 22, 1877.]

In Mr. R. B. Sharpe's paper on the Cuculidæ of the Ethiopian Region (P. Z. S. 1873, p. 599), in commenting on *Coccystes jacobinus*, Bodd., and *C. serratus*, Sparrm., he much underrates the "testimony" I have given that they are distinct species, and not ♂ and ♀ of one. My "testimony" is not simply "that they are not equally common in the parts of South Africa they inhabit;" and I should regret very much that it should be thought that my "testimony" as to the sexual differences of species described by me either in the 'Birds of South Africa,' or elsewhere, were based on no surer foundation than the numbers found in certain places.

Mr. Sharpe will find that, under the head of *Oxylophus edolius* (*C. serratus*, Sparrm.), I have distinctly alluded to the males and females, without giving any special description of the female, which was my custom when she (to my knowledge, *always obtained by dissection*) differed in any way from the male; and under that of *O. melanoleucus*, I state that Le Vaillant *mistook* this species for the female of the preceding. Nothing, I think, can be plainer and stronger "testimony" than this.

I can now add a little information which will appear in the second edition of the 'Birds of South Africa,' which Mr. Sharpe is bringing out. Mr. H. Bowker writes, "This is another cuckoo which I cannot quite make out from your description [he sent both species], but think it is *O. melanoleucus*, very common in Albany district, and appears early in October. It lays its egg in the nest of the 'Black Swallow-tail Spreo' (*Edolius musicus?*), and also in that of the Woodpecker, and looks after its young to see that the foster-parents are attentive to them. I once watched a Woodpecker's nest; and when the nurses brought food to the nest, they were always accompanied by one of these birds, who, after the Woodpeckers left, always looked in to see if all was right, and then sat near until the return of the Woodpeckers, when the same thing

was repeated. On examining the nest I found four fine young Cuckoos."

Of *O. edolius* he writes, "calls frequently during the night, particularly about 9 or 10 o'clock. I have found their eggs and young in the nests of the Small Butcher-bird (*Lanius silens*?)."

This is also pretty good testimony of the distinctness of the two species.

4. On a Collection of Lepidoptera from Cape York and the South-east Coast of New Guinea. By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Received May 15, 1877.]

In the 'Annals and Magazine of Natural History' for last year I published an account of the first collection of Lepidoptera sent home by the Rev. J. S. Macfarlane; it contained thirty-nine species, of which six were described as new to science.

The present collection contains fifty species; but one of them is too much rubbed for specific determination. The new species are nine in number, five of them being Butterflies and four Moths, as follows:—

Euplœa occulta. New Guinea.
Tenaris onesimus. New Guinea.
Lycœna conformis. Cape York.
Terias sana. Cape York.
Papilio macfarlanei. New Guinea.
Charocampa celata. Cape York.
Euchromia æmulina. Cape York.
Hydata spectabilis. Cape York.
Cryptophasa russata. Cape York.

Of species previously recorded, the most striking is a female of the rare and handsome "*Euplœa*" *mesocala* of Vollenhoven.

In the arrangement of the species I shall follow my previous list (Ann. & Mag. Nat. Hist. S. 4, vol. xviii. pp. 122–128), and that on Lepidoptera from Port Moresby (*l. c.* pp. 240–249).

RHOPALOCERA.

Family Nymphalidæ.

Subfamily Danainæ, Bates.

Genus Danais, Latreille.

1. Danais archippus.

Papilio archippus, Fabricius, Ent. Syst. iii. 1, p. 49 (1793).

Several examples. Cape York.

2. DANAIS AFFINIS.

Papilio affinis, Fabricius, Syst. Ent. p. 511 (1775).

Common. Cape York.

3. DANAIS HAMATA.

Euplœa hamata, Macleay, King's Surv. Austr. ii. p. 451 (1827).

Several examples. Cape York.

Genus EUPLŒA, Fabricius.

4. EUPLŒA ANGASII.

Euplœa angasii, Felder, Reise der Nov., Lep. ii. p. 343 ("1865").

One specimen. Cape York.

5. EUPLŒA MŒSTA.

Euplœa mœsta, Butler, P. Z. S. p. 284, fig. 3 (1866).

♂, ♀. Several examples. New Guinea.

This is the first occasion on which I have seen the female.

6. EUPLŒA OCCULTA, n. sp.

♂. Primaries blue-black, becoming brown upon the outer border; secondaries with the anterior half of the wings, excepting the costal area, which is whitish, dull black, bounded behind by dark castaneous brown, which shades off into pale brown at the anal area; the anal area crossed by four indistinct paler spots, forming an abbreviated discal series: body above black; wings below altogether paler, the borders being broadly brown; primaries with a white dot near the base of second median interspace; secondaries with two white spots at the base, one in the cell, and four in an oblique series just beyond it, the latter slightly lilacine in tint: pectus black, white-spotted, venter greyish, anal segments with central longitudinal white spots. Expanse of wings 3 inches 7 lines.

One specimen. New Guinea.

At first sight *E. occulta* might be mistaken for a large example of *E. mœsta*; but the absence of the two characteristic sericeous streaks on the primaries at once distinguishes it. It is in fact more nearly allied to *E. æthiops*; but its deeper coloration, broader wings, the paler anal area of secondaries crossed by still paler spots, and the absence of many of the spots on its under surface prove its distinctness.

Genus CALLIPLŒA, Butler.

7. CALLIPLŒA MESOCALA.

Euplœa mesocala, Vollenhoven, Tijd. voor Ent. 1873, p. 244, pl. xi. figs. 1, 2.

♀. New Guinea.

Originally described from examples obtained at Waigiou: Mr. Macfarlane's example is unfortunately a good deal rubbed, as though it had struggled in the net.

Subfamily Satyrinæ, Bates.

Genus Mycalesis, Hübner.

8. Mycalesis flagrans.

Mycalesis flagrans, Butler, Ann. & Mag. Nat. Hist. S. 4, vol. xviii. p. 243. n. 11 (1876).

Two examples. New Guinea.

Genus Ypthima, Hübner.

9. Ypthima arctous.

Papilio arctous, Fabricius, Syst. Ent. p. 489. n. 202 (1775).

Several specimens. Cape York.

Subfamily Morphinæ, Butler.

Genus Tenaris, Hübner.

10. Tenaris onesimus, n. sp.

♀. Primaries smoky brown, the apex and costa being darkest; a broad white patch enclosed between the subcostal and second median veins, and just impinging upon the end of the discoidal cell; secondaries white, tinted with ochraceous towards the base; the costa and a broad outer border smoky brown; thorax dark brown, whitish behind, palpi with black upper margin, otherwise ochreous; abdomen ochreous: primaries below as above; secondaries white, the veins, base, costa, and apical half of outer margin smoky brown; two large black ocelli, pupillated with white, adorned internally with a slender greyish crescent, with broad ochreous iris and narrow brown zone, one of them apical, the other upon the first median interspace, near the outer margin; pectus dark brown, venter ochreous. Expanse of wings 4 inches 7 lines.

One specimen. New Guinea.

Subfamily Nymphalinæ, Bates.

Genus Doleschallia, Felder.

11. Doleschallia australis.

Doleschallia australis, Felder, Reise der Nov. Lep. iii. pl. 51. figs. 1, 2 (1867).

One example. Cape York.

Genus Neptis, Fabricius.

12. Neptis mortifacies.

Neptis mortifacies, Butler, Trans. Ent. Soc. 1875, p. 5.

Several females. Cape York.

13. Neptis latifasciata.

Neptis latifasciata, Butler, Trans. Ent. Soc. 1875, p. 4.

One male. Cape York.

Genus Diàdema, Boisduval.

14. Diadema velleda.

Papilio velleda, Cramer, Pap. Exot. pl. 349. figs. C, D (1782).

A series of both sexes. ? New Guinea.

In the present consignment there are no specimens of the true *Diadema alimena*; I am therefore strongly inclined to believe that *D. velleda* is a good species confined to Southern New Guinea, and that the example previously noted (Ann. & Mag. ser. 4, vol. xviii. p. 124) was taken there, and not at Cape York: the habitat is not indicated.

Genus Cethosia, Fabricius.

15. Cethosia imperialis.

Cethosia imperialis, Butler, Ann. & Mag. Nat. Hist. S. 4, vol. xviii. p. 124. n. 15 (1876).

One example. Cape York.

Genus Junonia, Hübner.

16. Junonia albicincta.

Junonia albicincta, Butler, Trans. Ent. Soc. 1875, p. 5.

One dwarfed example. Cape York.

Genus Messaras, Doubleday.

17. Messaras turneri.

Messaras turneri, Butler, Ann. & Mag. Nat. Hist. S. 4, vol. xviii. p. 244. n. 17 (1876).

One dwarfed example. New Guinea.

Family Lycænidæ.

Subfamily Lycæninæ, Butler.

Genus Lycæna, Fabricius.

18. Lycæna conformis, n. sp.

Above brown distinctly shot with violet, excepting the costal and external borders, which are rather broadly olive-brown, fringe rather paler; body blackish: wings below sordid whitish; outer margin bordered by a slender black line; discocellulars and a submarginal series of spots, behind which is a series of lunules, brown; primaries with a dot in the cell, a second subcostal, and an arched discal series of six spots, black; secondaries with an irregular series of spots (encircling the discocellular litura from a short distance) formed of two lines, the first crossing the cell, the second forming an arc across the disk, all black; the whole of the spots on the under surface margined with pure white; body below white. Expanse of wings 10 lines.

One example. Cape York.

Allied to *L. lysizone*.

Genus Danis, Fabricius.

19. Danis taygetus.

Lycæna taygetus, Felder, Reise der Nov. Lep. ii. p. 321, pl. 33. figs. 19–21 ("1865").

One imperfect example. Cape York.

Family Papilionidæ.

Subfamily Picrinæ, Bates.

Genus Delias, Hübner.

20. Delias inferna.

Delias inferna, Butler, Lep. Exot. p. 63, pl. 24. fig. 6 (1871).

One shattered female. Cape York.

Genus Terias, Swainson.

21. Terias hecabe.

Papilio hecabe, Linnæus, Mus. Lud. Ulr. p. 249 (1764).

Several examples. Cape York.

22. Terias zoraide.

Terias zoraide, Felder, Reise der Nov. Lep. ii. p. 213. n. 229 ("1865").

Several examples. Cape York.

23. Terias sana, n. sp.

Sulphur-yellow; primaries above with the base slightly dusted with black scales; costal border (excepting at base), apical area, outer border to the first median branch and the margin beyond it dark brown; the border runs a short distance up each of the median branches, giving its internal edge a subsinuated appearance; secondaries with a black-brown border, beginning rather narrow at apex, and rapidly tapering off to a fine line, which terminates at the first median branch: body above black, below yellow; under surface of wings unspotted. Expanse of wings 1 inch 3 lines.

Two specimens. Cape York.

Most nearly allied to *T. venata* from India, but smaller, with narrower outer border, and unspotted under surface.

Genus Belenois, Hübner.

24. Belenois nabis.

Pieris nabis, Lucas, Rev. Zool. p. 326 (1852).

Two examples. Cape York.

Subfamily Papilioninæ, Bates.

Genus Ornithoptera, Boisduval.

25. Ornithoptera pronomus.

Papilio pronomus, G. R. Gray, Cat. p. 2, pl. 1. figs. 1 & 2 (1852).

Seventy specimens of both sexes. Cape York.

Genus Papilio, Linnæus.

26. Papilio adrastus.

Papilio adrastus, Felder, Reise der Nov. Lep. i. p. 110, pl. 16. figs. *a*, *b* (1865).

Several of both sexes. New Guinea.

27. Papilio pandion.

Papalio pandion, Wallace, Trans. Linn. Soc. xxv. p. 56. n. 72 (1865).

One female (like *P. onesimus*, but smaller). New Guinea.
This female appears to be modified in imitation of *Tenaris*.

28. Papilio polydorus.

Papilio polydorus, Linnæus, Syst. i. 2, p. 746 (1767).

Forty-eight specimens, of both sexes. Cape York.

29. Papilio choredon.

Papilio choredon, Felder, Verh. zool.-bot. Ges. xiv. p. 306 (1864).

One example. Cape York.

30. Papilio macfarlanei, n. sp.

Wings above black, spotted and banded with green, according to the general pattern of *P. agamemnon*, but the central series of spots enlarged so as to form a broad tapering macular band on the primaries, and a wedge-shaped band (white on costal area) on the secondaries; the submarginal spots and the discal spots of secondaries smaller than in *P. agamemnon*: primaries below differing in the same way as above, but the secondaries with very different basal area, more nearly resembling that of *P. telephus*, pale green with a broad brown belt parallel to the abdominal margin, and a short tapering streak (from the costa to the subcostal nervure) interupted upon the costal nervure by a scarlet spot, and terminating in a smaller scarlet spot; a few scarlet scales near the base of the interspace enclosed by the subcostal branches, and a scarlet spot above the black anal spot; no trace of the conspicuous white costal spot invariably found in *P. agamemnon*, or of the scarlet-edged black spot which precedes it. Expanse of wings 3 inches 9 lines.

Two specimens (rather worn). New Guinea.

Intermediate in character between *P. wallacei* and the succeeding species. We have a *Papilio* scarcely differing from it, from Ternate.

31. Papilio ægistus.

Papilio ægistus, Linnæus, Syst. Nat. i. 2, p. 754. n. 48 (1766).

Two shattered examples. New Guinea.

32. Papilio indicatus.

Papilio indicatus, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 248. n. 29 (1876).

Several worn specimens. New Guinea.

Genus Eurycus, Boisduval.

33. Eurycus cressida.

Papilio cressida, Fabricius, Syst. Ent. p. 448 (1775).

Several specimens of both sexes. Cape York.

34. Eurycus troilus.

♂ *Eurycus troilus*, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 247. n. 27 (1876).

Two or three worn specimens. New Guinea.

The female chiefly differs from that sex of *E. cressida* in its more rounded wings and less-defined markings.

HETEROCERA.

Family Sphingidæ.

Subfamily Chærocampinæ, Butler.

Genus Chærocampa, Duponchel.

35. Chærocampa celata, n. sp.

♂ Primaries above pale sandy brownish, clouded with pale brownish, olivaceous at the base and across the end of the cell to inner margin; the whole wing, but especially the external area, sprinkled with black and grey scales; an ill-defined greyish elbowed line crossing the wing at the basal fourth, a second greyish line crossing the wing obliquely from apical third of costa to middle of inner margin; traces of two parallel lines beyond the latter, followed immediately by a strongly defined dark brown line from the apex to the inner margin: secondaries buff-coloured, the costal area silky testaceous; a broad dull-black belt almost covering the basal half of the wing: body above pale pinky brownish, becoming gradually olivaceous towards the head; the head and thorax with well-defined pinky white borders. Wings below sandy ochraceous, sprinkled with greenish-grey scales, and crossed by two parallel greenish-grey oblique streaks, the outer one less defined than the inner; body below pinky whitish or pale flesh-coloured, the hinder part of the pectus being palest. Expanse of wings 3 inches 4 lines.

One example. Cape York.

Most nearly allied to *C. bistrigata*.

Family Agaristidæ.

Genus Agarista, Leach.

36. Agarista neptioides.

Agarista neptioides, Butler, Ann. & Mag. Nat. Hist. xv. p. 138 (1875).

A single male. Cape York.

Family ZYGENIDÆ.

Subfamily EUCHROMINÆ, Butler.

Genus EUCHROMIA, Hübner.

37. EUCHROMIA IRUS.

Sphinx irus, Cramer, Pap. Exot. iv. p. 150, pl. 368. fig. A (1782).

Several examples. Cape York.

38. EUCHROMIA ÆMULINA, n. sp.

Wings above black; primaries with two metallic green spots at the base; a spot near the base, a bifid spot across the median vein, an elongated subcostal spot beyond the cell, and a bifid spot across the second median branch hyaline white: secondaries with the costa brown; a trifid basal spot and a large trifid spot beyond the cell hyaline white: body dark brown; shoulders, front of collar, and metathorax ochreous; hind margins of abdominal segments ochraceous in front, carmine towards the anus; vertex of head white; hinder part of shoulders, collar, inner margins of tegulæ, hind margin of metathorax, and three spots on the basal segments of the abdomen opaline, varying from silvery white to green or blue; anterior coxæ white; venter carmine with a central series of black spots; anus testaceous and black. Expanse of wings 1 inch 7 lines.

One specimen. Cape York.

This beautiful species comes nearer to *E. aruica* of Walker than to any other described form. The pattern of the wings is quite like *Syntomis*.

Subfamily SYNTOMINÆ, Butler.

Genus SYNTOMIS, Ochsenheimer.

39. SYNTOMIS MARSDENI.

Syntomis marsdeni, Moore, Proc. Zool. Soc. 1859, pl. 60. fig. 3.

Two specimens. Cape York.

This is another instance of the same Lepidopterous insect occurring in Java and Australia.

Family ARCTIIDÆ.

Genus AREAS, Walker.

40. AREAS PUNCTIPENNIS.

Areas punctipennis, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 126. n. 30 (1876).

One example. Cape York.

Family LITHOSIIDÆ.

Genus THEMISCYRA, Walker.

41. THEMISCYRA MACTATA.

Mieza mactata, Felder, Reise der Nov. Lep. v. pl. cxxxix. fig. 44 (1876).

Themiscyra varicosa, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 126. n. 31 (1876).

One example. Cape York.

My description was published a week or two too late to secure priority.

Genus ARGINA, Hübner.

42. ARGINA CRIBRARIA.

Phalæna cribraria, Clerck, Icones, pl. 54. fig. 4 (1764).

One example. Cape York.

This species seems to be common all over the Old World with the exception of Europe.

Family HYPSIDÆ.

Genus HYPSA, Hübner.

43. HYPSA DAMA.

Noctua dama, Fabricius, Sp. Ins. ii. p. 216 (1781).

One example. Cape York.

Genus DAMALIS, Hübner.

44. DAMALIS ALCIPHRON.

Phalæna alciphron, Cramer, Pap. Exot. ii. pl. 133. fig. F (1779).

One example. Cape York.

Family CHALCOSIIDÆ.

Genus HELEONA, Swainson.

45. HELEONA FENESTRATA?

Heleona fenestrata, Swainson, Zool. Ill. pl. 116 (1832–33).

One specimen. Cape York.

The single specimen sent has the primaries so much rubbed that I cannot be certain that it is the true *H. fenestrata*; but if not, it is a nearly allied species.

Family URANIIDÆ.

Genus NYCTALEMON, Dalman.

46. NYCTALEMON PATROCLUS.

Papilio patroclus, Linnæus, Mus. Lud. Ulr. p. 204 (1764).

One shattered female. New Guinea.

Family MACARIIDÆ.

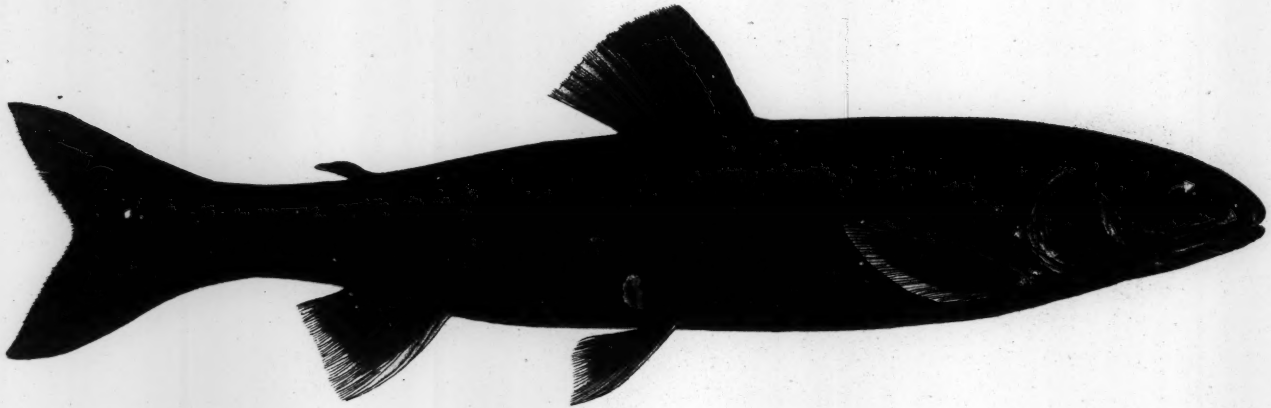
Genus HYDATA, Walker[1].

47. HYDATA SPECTABILIS, n. sp.

Wings hyaline white; above with a broad pale brown or sordid cream-coloured outer border: primaries strongly falcated, sinuated

[1] A genus agreeing in venation with *Macaria*, but with transparent wings, the secondaries not angulated or caudated, but sinuated.

BRITISH MUSEUM



SALMO NARESI.

R. Mintern lith.

Mintern Bros imp.

below the apex; base brownish or sordid cream-coloured, bounded externally by an oblique brown line; a second elbowed line, its upper portion represented by the discocellulars, the lower by a streak to the inner margin; outer border (excepting at apex) greyish brown; three brown costal spots, the one nearest the base indistinct: secondaries creamy towards the base; body creamy whitish. Wings below with blackish discocellular spots; outer border of primaries, excepting at apex, and inner edge of border of secondaries covered with dense confluent red-brown striations; secondaries with a black costal spot; body white. Expanse of wings 1 inch 8 lines.

One example. Cape York.

Family GELECHIIDÆ.

Genus CRYPTOPHASA, Lewin.

48. CRYPTOPHASA RUSSATA, n. sp.

Primaries shining ferruginous; the costal border snow-white; the base, outer border, outer half of inner border, and a streak from the outer border through the discocellulars to the centre of the discoidal cell slaty greyish: secondaries pale ferruginous: head, collar, and base of antennæ snow-white; thorax ferruginous; prothorax whitish in front; abdomen pale ferruginous. Under-surface pale shining ferruginous. Expanse of wings 1 inch 4 lines.

One specimen. Cape York.

Allied to *C. rubescens*, but smaller, of a more elegant form, and differently coloured.

Genus CRYPTOLECHIA, Zeller.

49. CRYPTOLECHIA NIVELLA?

Cryptolechia nivella, Walker, Lep. Het. xxix. p. 751 (1864).

One specimen. Cape York.

5. Report on a Collection of Fishes made by Mr. C. Hart during the late Arctic Expedition. By DR. ALBERT GÜNTHER, F.R.S., Keeper of the Department of Zoology, British Museum.

[Received May 22, 1877.]

(Plate L.)

Some months after the Report on Capt. Feilden's collection of Fishes[1] had been prepared, the British Museum received specimens collected by Mr. C. Hart, Naturalist on board of H.M.S. 'Discovery.' He obtained eight species within the Arctic Circle, three

[1] Proc. Zool. Soc. 1877, p. 293.

of which were not contained in Capt. Feilden's collection, as will be seen from the following list :—

I. *Marine Species, collected in Franklin-Pierce Bay, August* 11, 1875.

1. ICELUS HAMATUS, Kröy.

2. TRIGLOPS PINGELII, Reinh.

No specimens of this fish were previously in the national collection. It appears to be much scarcer than the preceding. Externally the ventral fin appears to be composed of three rays; but on dissection four long rays and one rudimentary one are found.

3. CYCLOPTERUS SPINOSUS, adult[1].

Ova contained in the same bottle as these specimens are of the size of large hemp-seed.

4. LIPARIS FABRICII, Kröy.

5. GYMNELIS VIRIDIS, Fabr.

6. GADUS FABRICII, Rich.

II. *Freshwater Species obtained from Lakes in Discovery Bay.*

1. SALMO ALIPES, Rich.

Of this species two examples were obtained, about 15 inches long; it is a well-marked species of Charr, characterized by the deep radiating and concentric striation of the gill-covers. The typical specimens were obtained in Boothia Felix; so that this Charr has an unsually wide range. Colour silvery, with scarcely any pinkish tinge. Cæc. pyl. 41.

2. SALMO NARESII, n. sp.

The body much elongate, its greatest depth being one fifth, or even one sixth, of the total length, without caudal. The length of the head is one fourth or two ninths of the same length, and nearly one half of the distance between the snout and the vertical from the origin of the dorsal fin. The snout is obtuse, the forehead flat; and the maxillary extends in the male to the vertical from the hind margin of the orbit, but in the female it is somewhat shorter. Teeth

[1] *Cyclopterus lumpus* we did not receive either from Capt. Feilden or Mr. Hart. It does not seem to extend so far northwards as *C. spinosus*. Mr. Horner, the Naturalist of the 'Pandora,' to whom we are indebted for several valuable additions to our series of Arctic animals, collected very young examples in lat. 64° 53′ and long. 53° 20′ W. attached to *Fucus vesicula*. He remarks that these little fishes are very similar in form and colour to the air-vessels of that plant.



$\frac{1}{3}$

J.Smit lith.

Hanhart imp.

LAMPRIBIS OLIVACEA.

very small, those of the vomer limited to the anterior extremity of the bone, a band of villiform teeth along the middle of the hyoid. Præoperculum with the angle much rounded, and without a distinct lower limb; suboperculum more than twice as long as deep. The gill-cover shows scarcely a trace of the radiating and concentric striæ by which *Salmo nitidus* is characterized. Pectoral shorter than, or equal in length to, the head without snout; and at least one half or more than one half of the distance of its root from the ventral. Ventral fins terminating at a considerable distance from the vent. D. 13; the largest ray scarcely longer than the distance of the eye from the end of the operculum. A. 11. Caudal deeply excised, its middle rays not quite half as long as the outer ones. Scales minute. Branchiostegals 11.

Pyloric appendages 42. Vertebræ 65.

Upper parts light greenish olive, passing into the silvery coloration of the sides. Lower part of a deep reddish-pink colour. Sides with very small red spots. Dorsal and upper part of the caudal of the colour of the back. Paired fins and anal and lower part of caudal deep red, with yellowish white margins.

Several specimens were obtained in a freshwater lake near to the winter-quarters of the 'Discovery,' in a depth of from 10–15 fathoms.

This is a small species, the largest example measuring 10 inches, all the others, males and females, being only 8 inches long. Yet the sexual organs were fully developed, and the ova ready for exclusion.

By associating the name of Sir George Nares with one of the novelties brought home by the Arctic Expedition, I pay only a small tribute of the esteem in which all zoologists hold the leader of the 'Challenger' and Arctic Expeditions.

6. Review of the *Ibidinæ*, or Subfamily of the Ibises. By D. G. Elliot, F.R.S.E., F.L.S., &c. &c.

[Received May 22, 1877.]

(Plate LI.)

The materials by means of which the present paper has been written are contained in the Museum of Paris and in the collections of Messrs. Salvin and Godman, and Captain G. E. Shelley.

The collection of the Paris Museum is very rich in these birds, and contains several of the types of older writers, as Cuvier &c.; and I have to acknowledge my indebtedness to Prof. A. Milne-Edwards and M. Oustalet for the facility afforded me in making my investigations. In the following paper I have given the literature of the subfamily, classification, genera, and geographical distribution, together with the synonymy for each species as I have been able to determine it.

I commence with the literature of the family :—

1766. Linnæus, 'Systema Naturæ.'

Seven species are given by this author, some of which do not belong to the present group, and all but one are included in the genus *Tantalus*. The valid species are *T. falcinellus* (= *Falcinellus igneus*), *T. rubra* (= *Eudocimus ruber*), *T. albus* (= *E. albus*) and *Scolopax guarauna* (= *F. guarauna*), probably the young of the glossy *Ibis* with a white forehead. Species 4.

1783. Boddaert, 'Table des Planches Enluminées.'

Three species of *Ibis* are apparently named for the first time, viz. *Lophotibis cristata* as *Tantalus cristatus*, *Theristicus caudatus* as *Scolopax caudatus*, and *Geronticus calvus* as *Tantalus calvus*. Species 7.

1788. Gmelin, 'Systema Naturæ.'

Twenty-one species are given under the genus *Tantalus*, of which the following are valid—*T. igneus, calvus, cristatus, ruber, albus, cayanensis* (described for the first time), and *melanopis* (= *caudatus*, Bodd.). The remainder are either synonymous with previously described species, or do not belong to this subfamily. Species 8.

1790. Latham, 'Index Ornithologicus.'

Twenty-three species are recorded, mainly those in the list given by Gmelin. The following are described for the first time: *Tantalus melanocephalus, T. hagedash*, and *T. æthiopicus*. Species 11.

1817. Vieillot, 'Nouveau Dictionnaire d'Histoire Naturelle.'

Twenty species are here given, all included in the genus *Ibis*, one, however, not belonging to this group, viz. *Ibis nandapoa* (= *Mycteria americana*, Lath.). Only one species is described as new, viz. *Ibis cærulescens*. Species 12.

1820–1839. Temminck, 'Planches Coloriées.'

Five species are here given, and four described, two of which are valid. They are *Ibis leucon* (= *T. melanocephalus*, Lath.), *Ibis papillosa, Ibis nippon, Tantalus chalcopterus* (= *S. guarauna*, Linn.), and *Ibis plumbea* (= *Ibis cærulescens*, Vieill.) Species 14.

1823. Lichtenstein, 'Verzeichniss der Doubletten des zoolog. Museum zu Berlin.'

The *Curucáu afeytado* of Azara is named *Ibis infuscata*; no description is added. Species 15.

1823. Vieillot, 'Encyclopédie Méthodique.'

Tantalus hagedash, Lath., is described as *Ibis chalcopterus*; and as *Hagedash* has been employed as a generic term (*Hagedashia*), Vieillot's specific name is retained.

1825. Spix, 'Avium species novæ' &c.

Cercibis oxycerca is described as *Ibis oxycerca*. Species 16.

1829. Wagler, 'Isis.'

Several species of this group of birds are mentioned in the 'Isis' of this year, some of which are described as new; but none are valid. The species named are *Ibis guarauna*, *I. macei* (=*I. melanocephalus*, Lath.), *I. papillata* (= *I. papillosa*, Temm.), *I. calva*, and *I. gonocephala* (= *Tantalus* = *I. calvus*, Bodd.).

1832. Wagler, 'Isis.'

Several genera for these birds are proposed, as follows, and a list given of their species:—*Ibis*, Cuv., *ex parte*, to contain *I. religiosa* (=*Tantalus æthiopicus*, Lath.), *I. macei* (=*T. melanocephala*, Lath.), and *I. molucca*, Cuv. (=*T. æthiopicus*, Lath.); *Tantalides* has *T. falcinellus* (=*Falcinellus igneus*), and *T. guarauna*; *Theristicus* possesses *T. melanopis* (= *Scolopax caudatus*, Bodd.); *Geronticus* with *G. calvus* and *I. papillata* (= *I. papillosa*, Temm.); *Harpiprion* has *Ibis cayennensis*, *I. dentirostris* (= *T. cayanensis*, Gmel.), and *I. plumbea* (=*I. cærulescens*, Vieill.); *Eudocimus* contains *Ibis rubra*, *I. alba*, and *I. longirostris*, Wagl. (= *T. albus*, Linn.); *Cercibis* to have *I. oxycerca*, Spix; *Phimosus* represented by *I. infuscata*, Lich., and *I. nudifrons*, Spix. (= *I. infuscata*, Licht.).

1835. Rüppell, 'Fauna Abyssinica.'

Bostrychia carunculata described and figured as *Ibis carunculata*. Species 17.

1835. Jameson, 'Edinburgh New Philosophical Journal.'

Carphibis spinicollis described as *Ibis spinicollis*. Species 18.

1837. Du Bus, 'Bulletin de l'Académie de Bruxelles.'

Lampribis olivacea described as *Ibis olivacea*. Species 19.

1844–1849. G. R. Gray, 'Genera of Birds.'

In this valuable publication, the Ibises are placed in the family Ardeidæ, and compose its fifth subfamily. Three genera are consigned to it, viz.:—*Tantalus*, properly belonging to the Ciconiidæ; *Ibis*, with five species, only three of which are valid according to the present writer's views; and *Geronticus*, with eighteen species, fourteen of which are good. The various genera proposed by other authors are merged in *Geronticus*, which is not admissible, as the species of this group represent many distinct genera worthy of recognition.

1845. Rüppell, 'Systematische Uebersicht der Vögel Nord-Ost-Afrika's.'

Comatibis comata, described as *Ibis* (*Geronticus*) *comata*. Species 20.

1857. Bonaparte, 'Conspectus Generum Avium.'

The Ibises here form the subfamilies Ibinæ and Eudociminæ of the Tantalidæ; and sixteen genera are employed. *Ibis* contains five species, three of which are good, *I. bernieri*, of Madagascar, being separated from *I. æthiopica*: *Nipponia*, and *Carphibis*, each with one valid species. In the division Geronticeæ we have *Bostrychia*,

Hagedashia, Comatibis, Geronticus, Inocotis, and *Lophotibis,* all possessing one species each, excepting the second named, which has two. The division Phimosæ has *Molybdophanes, Theristicus, Harpiprion, Cercibis,* and *Phimosus,* each with one species, save the second, which has two, only one of which is valid. The second subfamily, Eudociminæ, contains *Eudocimus,* with three species, two only of which are valid, and *Falcinellus* with six, one of which alone is good. Constituting two subfamilies for this group of birds is practically unnecessary; and several of the so-called species are founded upon immature specimens. The genera employed, however, are apparently required, unless all these birds should be retained under one genus, which does not seem to be advisable in view of the many and important differences exhibited by the various species. Species 21.

1870. Swinhoe, 'Proceedings of the Zoological Society of London.'
Ibis melanocephala described as *Ibis propinqua.*

1874. Ridgway, 'American Naturalist.'
Falcinellus thalassinus described as *Ibis thalassina.* Species 22.

1875. Hume, 'Stray Feathers.'
Graptocephalus davisoni described as *Geronticus davisoni.* Species 23.

1876. Allen, 'Bulletin of the Museum of Comparative Anatomy of Cambridge.'
Falcinellus ridgwayi described. Species 24.

1877. Oustalet, 'Bulletin de la Société Philomatique de Paris.'
Thaumatibis gigantea described as *Ibis gigantea,* and *Graptocephalus davisoni* described as *Ibis davisoni.* Species 25.

Classification.

The birds composing the groups treated of in this paper are intermediate between the *Tantali* on the one hand and the *Numenii* on the other. They are removed from the Herons by several important characters, such as the possession of a small, muscular stomach, very long and slender intestine, and small cæca, in contradistinction to the large membranous stomach, very long and slender intestine, and absence of cæca of the Herons. With the Spoonbills they are very closely allied, these last being "Ibises with the bill flattened and expanded towards the extremity." These two groups, then, *Ibis* and *Platalea,* I consider as forming two subfamilies of one family, for which, in consideration of the former being much the larger and more important in regard to the number of its species, I adopt the term Ibididæ, the subfamilies being called respectively Ibidinæ and Plataleinæ. To the first of these divisions this paper is restricted. Numerous genera have been instituted for the reception of the various species; and I have adopted a considerable proportion of them. Either all the species must be

kept in one genus, or else a number of genera must be recognized; for there is very great variation among the members of the subfamily in the extent and mode of distribution of the bare skin upon the head, face, and neck, as well as in the shape and presence of the scutella upon the tarsi. Of the twenty-two genera proposed at different periods by successive writers, as given below, I have retained nineteen, which seem to be sufficient to include all the species known to ornithologists at the present day. I commence my arrangements of these birds with the genus *Ibis*, formed by Savigny for the sacred Ibis of the ancients (*Tantalus æthiopicus*, Lath.). This genus contains three species, conspicuous for having the head and neck entirely denuded of feathers. This is succeeded by *Thaumatibis*, instituted for the extraordinary bird having a body in form and size like a *Tantalus*, but with the head and feet of an *Ibis*,—to be followed by *Graptocephalus*, with its single species, having a curiously coloured head and neck, and a skull similar in shape to its gigantic predecessor. There is now a gap, and the genus I place next seems to be as well fitted in here as anywhere; for, as in all other groups of birds, there are also missing links among the Ibidinæ, that we are not able to supply, the species which would have fitted the gap having probably long since become extinct. *Carphibis* therefore comes here, with its single species, having the head and throat bare, the neck only partially so. *Inocotis* succeeds, containing the curious bird with the back of the head covered with scarlet papillæ; and this is followed by *Comatibis* with one species. *Geronticus* is next, with one species; after which is *Phimosus*, also with one species, having top and sides of head and throat nude; followed by *Nipponia*, with the bare space like the other, but not continuing onto the throat. All the species thus far have the head mostly denuded of feathers, and form a kind of group by themselves, separated, in a measure, from the other members of the Ibidinæ, which have the top of the head covered with feathers. Of this second section, *Cercibis* is first, with one species, followed by *Theristicus*, with also only one member; after which comes *Lophotibis*, formed for the beautiful bird from Madagascar; and this is followed by *Hagedashia* with only one species. We now reach *Bostrychia* with its single species, remarkable for the lengthened wattle pendent from the throat; and this is succeeded by *Harpiprion* with only one member, which is followed by *Molybdophanes* with but a single species. *Falcinellus* comes next, with four species, the largest number that any of the genera contain, succeeded by *Lampribis* with its single species, distinguished from the members of the previous genus by the bare skin including and extending considerably behind the eye, and reaching all round the base of the bill, and from the next genus by having a feathered throat. The last is *Eudocimus* with two species, the well-known white and red Ibis.

Genera.

Many genera have been proposed for the different species contained in this paper, more, perhaps, than are strictly required. Some

writers have preferred to employ them as subgeneric divisions, while others, ignoring them entirely, have placed all the birds in this subfamily under one genus, *Ibis*. From a careful examination of the subject it appears to me that either the latter view must be adopted, and but one genus recognized, or else quite a number must be employed, as the species certainly vary greatly among themselves, and by such characters as are usually deemed generic. Considering that more than one generic form is clearly to be perceived among these birds, I have referred the different species to those in which it seemed they should properly be retained. Some authors have taken the genus *Ibis*, as defined by Moehring, with *Tantalus ruber*, Linn., as the type. Moehring, however, does not come within the number of those writers who are accepted as authorities either for genera or species; and therefore *Ibis*, as referred by him, cannot in any way be taken into consideration. Lacépède was the first to define the genus *Ibis* after the time of Linnæus (the starting-point of ornithological nomenclature); but he unfortunately did not designate any type for his genus; so it cannot be accepted. The next author who proposed a generic division for these birds was Bechstein, who, in 1803, gave the term *Falcinellus* to the *Tantalus falcinellus* of Linnæus; and in 1810 Savigny defined the genus *Ibis* with *Tantalus æthiopicus*, Lath., the sacred Ibis of the ancients, as his type. It will thus be seen that *Ibis* cannot in any way be used for the American species of this subfamily, as has been generally the practice.

In the following enumeration of the terms that have been proposed, I commence with Bechstein, and bring the list down to the present day, giving with each genus the species employed as its type:—

	Type.
(1803) *Falcinellus*, Bechst., Gem. Nat. (nec Vieill.)	*Tantalus falcinellus*, Linn.
(1810) *Ibis*, Savigny, Système des Oiseaux de l'Egypte et de la Syrie, p. 392	*Tantalus æthiopicus*, Lath.
(1832) *Tantalides*, Wagler, Isis (nec Reich.)	*Tantalus falcinellus*, Linn.
(1832) *Theristicus*, Wagl. ibid.	*Scolopax caudatus*, Bodd.
(1832) *Geronticus*, Wagl. ibid.	*Tantalus calvus*, Bodd.
(1832) *Harpiprion*, Wagl. ibid.	*Tantalus cayennensis*, Gmel.
(1832) *Eudocimus*, Wagl. ibid.	*Tantalus ruber*, Linn.
(1832) *Cercibis*, Wagl. ibid.	*Ibis oxycerca*, Spix.
(1832) *Phimosus*, Wagl. ibid.	*Ibis infuscata*, Licht.
(1842) *Threskiornis*, G. R. Gray, App. List Gen. Birds, p. 13	*Tantalus æthiopicus*, Lath.
(1851) *Comatibis*, Reichenb. Novitiæ, Synop. Avium, pl. 291. figs. 2383, 2384	*Ibis comata*, Rüpp.
(1851) *Nipponia*, Reichb. ibid. pl. 141. fig. 538	*Ibis nippon*, Temm.
(1851) *Molybdophanes*, Reichb. ibid. pl. 139. fig. 524	*Ibis cærulescens*, Vieill.
(1851) *Lophotibis*, Reichb. ibid. pl. 83. fig. 637	*Tantalus cristatus*, Bodd.
(1851) *Inocotis*, Reichb. ibid. pl. 140. fig. 533	*Ibis papillosa*, Temm.
(1851) *Carphibis*, Reichb. ibid. pl. 82. figs. 1009, 1010	*Ibis spinicollis*, James.
(1851) *Guara*, Reichb. ibid. pl. 139. figs. 525–527	*Tantalus ruber*, Linn.
(1851) *Leucibis*, Reichb. ibid. pl. 141. fig. 526, pl. 361. figs. 2825, 2826, pl. 292. fig. 2385	*Tantalus albus*, Linn.
(1851) *Bostrychia*, Reichb. ibid. pl. 83. fig. 1011	*Ibis carunculata*, Rüpp.
(1857) *Hagedashia*, Bon. Consp. Gen. Av.	*Tantalus hagedash*, Lath.

(1877) *Graptocephalus*, Elliot, gen. nov. ..... *Geronticus davisoni*, Hume.
(1877) *Thaumatibis*, Elliot, gen. nov. ..... *Ibis gigantea*, Oustalet.
(1877) *Lampribis*, Elliot, gen. nov. ..... *Ibis olivacea*, Du Bus.

KEY TO THE GENERA.

A. Head, and neck for nearly its entire length naked.
  a. Skull oblong on top; webs of scapulars decomposed; tarsi and middle toe equal ..... 1. *Ibis.*
  b. Skull square on top, middle toe three fourths the length of tarsus ..... 2. *Thaumatibis.*

B. Head and upper part of neck naked.
  a. Skull square on top; occiput sloping to forehead, which descends rapidly to maxilla. Tarsus half an inch longer than middle toe ..... 3. *Graptocephalus.*
  b. Skull oblong on top.
    a'. Base of neck covered with stiffened spiny shafts ... 4. *Carphibis.*
    b'. Back of head covered with papillæ ..... 5. *Inocotis.*

C. Head and throat naked; occiput projecting beyond the line of the neck; neck feathered behind nearly to the head.
  a. Neck covered with loose, extremely narrow, lengthened and pointed feathers; tail long, rounded ..... 6. *Comatibis.*
  b. Neck covered with soft short feathers; tail long, square 7. *Geronticus.*

D. Front and sides of head, and throat, naked..... 8. *Phimosus.*

E. Fore part of head on top and face naked; throat feathered ..... 9. *Nipponia.*

F. Top of head feathered.
  a. Sides of head and throat naked; tail very long, cuneate 10. *Cercibis.*
  b. Space around the eye and line on sides of throat naked 11. *Theristicus.*
  c. Space around the eye bare; throat covered with long feathers; head crested ..... 12. *Lophotibis.*
  d. Space between the eye and maxilla bare; a naked line on throat along the lower margin of mandible ..... 13. *Hagedashia.*

G. Head and throat feathered.
  a. Bare wattle pendent from the throat..... 14. *Bostrychia.*
  b. Narrow line on forehead at base of culmen and space between the eye and maxilla bare ..... 15. *Harpiprion.*
  c. Space between eye and maxilla bare.
    a'. Feathers of the neck long and loose; thighs feathered nearly to the knee..... 16. *Molybdophanes.*
    b'. Feathers of the neck short; thighs bare for nearly their entire length..... 17. *Falcinellus.*

H. Forehead and space around and behind the eye naked.
  a. Throat feathered ..... 18. *Lampribis.*
  b. Throat naked..... 19. *Eudocimus.*

GEOGRAPHICAL DISTRIBUTION.

The birds composing the subfamily of which this Monograph treats are distributed everywhere throughout the globe, being found in every zoogeographical division yet named; and if the number of species of a family which exists in any particular portion of the earth is an indication that it there had its origin, then we may consider that *Ibis* appeared first in the eastern hemisphere; for, of the twenty-five species recognized in this paper, fifteen are found to dwell upon the eastern continents, or on the islands composing the Indian

archipelago; and eight of these, or a little over half, are natives of the Ethiopian region.

In reviewing the geographical distribution of the members of the Ibidinæ, commencing in the far east, and treating those species met with in the Australian regon, it will be found that the great continent of Australia possesses three species, viz. *I. æthiopica*, *Carphibis spinicollis*, and *Falcinellus igneus*. The second of these has not been obtained as yet elsewhere, although it is stated to have been seen once in New Guinea. The first of the species above named (*I. æthiopica*) has quite an extended range, as it apparently is identical with the African species, and, besides Australia, it is found also in Ceram and Salwatty of the Austro-Malayan division of the Australian region. Anciently this species was a dweller in Egypt, as it was there worshipped, and the mummied remains are found in great numbers; but there is no authentic record of its having been seen in that land in modern times.

Another great division in which these birds are found is the Oriental region; and here we see that in India, as usually understood, the *Geronticus papillosus* and *I. melanocephala* are distributed generally. The last-named species is also a native of Ceylon and Java of the Indo-Malayan islands; and the *Graptocephalus davisoni* is an inhabitant of the Tenasserim Provinces.

In the Indo-Chinese subregion the extraordinary *Thaumatibis gigantea* is found in Cochin China, and *Graptocephalus davisoni* in Siam and Cambodja. In the Palæarctic region the *Nipponia nippon* is found in Siberia, Northern China, and Japan, and also in Formosa of the Oriental region.

The Ethiopian region, the next in order, has the *I. æthiopica* distributed generally south of the Great Sahara. In Abyssinia the *Bostrychia carunculata* and *Comatibis comata* are found, the latter species extending its range northward to Algeria in the Palæarctic region, its limits being apparently the northern edge of the great desert. Proceeding southwards along the east coast, the *Geronticus calvus* is met with in the vicinity of the Orange river; and this species seems to go quite across the continent, as it is also a native of Damara Land on the west coast. On this side also the *Hagedashia chalcoptera* ranges from the Gambia in the north to the Cape colony; and the *Lampribis olivacea* is met with on the Guinea coast and on Prince's Island.

Madagascar (Malayan subregion) has three species, *I. melanocephala*, *Lophotibis cristata*, and *I. bernieri*. The last two are not found elsewhere, while the *I. bernieri* is very closely allied to the *I. æthiopica*. One other species remains to be noticed, the *Falcinellus igneus*, which is found nearly everywhere throughout the eastern hemisphere.

In the Nearctic region five species of *Ibis* occur; but of them one is only an accidental visitor. The *Falcinellus igneus* is met with in the Alleghany subregion, occasionally as far north as Massachusetts. *F. guarauna* is found in the middle province of the United States and northward to the Columbia river, while *F. thalassinus* is met with on the Pacific coast to California. The *Eudocimus ruber* is only a

straggler; and I am not aware of a specimen having been procured within the limits of this region, although it has been seen a few times by naturalists. *Eudocimus albus* is found in the southern part of the Alleghany and Rocky-mountain subregions, going northwards as far as the Carolinas and westwards to Texas.

In the Neotropical region the remaining species of the subfamily are found.

Beginning in the north with the Mexican subregion, we have the *E. albus* and the *Harpiprion cayanensis*, which range from Panama, along the northern portion of South America and down the east coast into Brazil—the Brazilian subregion. In the Antillean subregion we find the *F. igneus* in the islands of Cuba and Porto Rico, and perhaps some more; and the *E. ruber* is a native of Cuba and probably other islands to the southwards, as it is stated to be abundant on the Orinoco and Amazons, in the Brazilian subregion.

In Columbia the *Phimosus infuscatus* is met with; and this species extends its range southwards to the Argentine Republic. *Theristicus caudatus* inhabits the continent from Peru on the north to the Straits of Magellan; and the *H. cærulescens* is a native of Brazil and the Argentine Republic. *C. oxycerca* is found in Brazil in the Amazonian subregion, and as far westward as Columbia. *F. guarauna* appears to be spread over the whole of South America, with perhaps the exception of Peru. In this last country *F. ridgwayi* is found; and *F. thalassina* is an inhabitant of the west coast from the Straits of Magellan to California in the Nearctic region.

1. Ibis æthiopica.

Tantalus æthiopicus, Lath. Ind. Orn. (1790), vol. ii. p. 706. sp. 12.

Numenius ibis, Cuv. Ann. du Mus. (1805) vol. iv. p. 116, t. 53.

Ibis religiosa, Savig. Hist de l'Egypte (1810) Ois. t. 7. fig. 1, (text) vol. iii. p. 392; Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 9; Temm. Man. Ornith. (1820) vol. iv. p. 390; Vieill. Ency. Méth. (1823) p. 1144; Wagl. Syst. Av. (1827) sp. 2; Hemp. & Ehrenb. Sym. Phys. (1828) p. 17; Cuv. Règn. Anim. (1829) p. 519; Less. Trait. Orn. (1831) p. 568. sp. 15; Wagl. Isis (1832) p. 1231; Sykes, Proc. Zool. Soc. (1832) p. 160. sp. 188; Bon. Consp. Gen. Av. (1857) vol. ii. p. 151; Schleg. Mus. Pays-B. (1863) livr. iv. p. 12; Kirk, Ibis (1864) p. 364; Bree, B. Eur. 1st ed. vol. iv. p. 45, pl. 13; Schleg. Proc. Zool. Soc. (1866) p. 425; Sharpe, Proc. Zool. Soc. (1871) p. 614.

Ibis egretta, Temm. Man. Orn. vol. iv. p. 391; Bon. Consp. Gen. Av. (1857) vol. ii. p. 151.

Ibis molucca, Cuv. MS. Mus. Paris; id. Règn. Anim. p. 520; Less. Trait. Orn. (1831) p. 568. sp. 13.

Tantalus ibis, J. Brookes, Linn. Trans. vol. xvi. (1830) p. 499.

Ibis strictipennis, Gould, Proc. Zool. Soc. (1837) p. 106; Bon. Consp. Gen. Av. (1857) vol. ii. p. 151; Schleg. Mus. Pays-B. (1863) livr. 4, p. 14; Garrod, Proc. Zool. Soc. (1873) pp. 467, 638.

Threskiornis strictipennis, Gould, B. Austr. vol. vi. pl. 46; id. Hand-b. B. Austr. (1865) vol. ii. p. 284.

Threskiornis æthiopicus, Gray, App. List Gen. Birds (1842) p. 13; Gurney, Ibis (1860) p. 219, (1865) p. 275.

Geronticus strictipennis, Gray, Gen. B. (1849) vol. iii. p. 567. sp. 7; id. Hand-l. B. (1871) pt. iii. p. 40.

Geronticus æthiopicus, Gray, Gen. B. (1849) vol. iii. p. 566. sp. 5; Layard, B. S. Afr. (1867) p. 320. sp. 604; Gray, Handl. B. (1871) pt. iii. p. 40; Bartlett, Ibis (1876) p. 211.

Ibis æthiopica, von Heugl. Syst. Ueber. Vög. Nordost.-Afr. (1855) p. 213. sp. 633; Gurney, Ibis (1868) p. 259; Finsch & Hartl. Vög. Ost.-Afr. (1870) p. 783; Gurney, Anderss. B. Damaral. (1872) p. 297; Shelley, B. Egypt (1872) p. 261; Heugl. Ornith. Nordost.-Afr. (1873) Band ii. Abth. 1, p. 1135; Ayres, Ibis (1874) p. 105.

Thresciornis religiosa, Hartl. Syst. Orn. W. Afr. (1857) p. 232. sp. 658; Gurney, Ibis (1859) p. 153. sp. 9, (1865) p. 275.

Hab. Africa, Senegambia (*Hartl.*); Casamanze (*Verr.*); Mossambique (*Peters*); Cameroons (*Crossley*); Transvaal (*Ayres*); St. George, Elmina, Gold-Coast (*Pel*); Australia, Ceram (*Schlegel*); Salawatty (*Rosenberg*).

The Sacred Ibis is no longer met with upon the Nile south of Kartoum; and I do not know of any authentic account of its having been seen in Egypt in modern times. In ancient days it must have been very numerous, as great quantities of mummies of these birds are found in the tombs and pits throughout Egypt. Strabo states that every street in Alexandria was full of them in his time, and they were useful in picking up all kinds of offal thrown out of the butchers' shops. He also says they were troublesome because they devoured every thing, were dirty, and were prevented with difficulty from polluting what was clean and not given to them. Hermopolis was the patron city of this bird; and it appears to have been worshipped throughout the land. It was the emblem of Thoth, the scribe of Osiris, who wrote down the deeds of the deceased; and its portrait is seen upon many of the monuments that remain. Vierthaler says that on the White and Blue Nile it builds in trees, nesting in great companies during the months of August, September, and October.

This species is the type of Savigny's genus *Ibis*; and I have consequently retained this term for it and its congeneric relatives.

Mr. Gould has separated, in his 'Birds of Australia,' the Black-necked Ibis of that country from *I. æthiopica*, on account of the lengthened feathers on the lower part of the throat, and has called it *I. strictipennis*; and the species has generally been accepted by ornithologists as valid. Another less conspicuous character is the extent of the dark-green colour on the ends of the primaries. Inasmuch as the lengthened neck-feathers of *I. melanocephala* are present in some specimens and not in others (being assumed in the breeding-season), and are therefore of no value as a specific character, it does not seem at all natural that the same character among speci-

mens of the present species should entitle such individuals to a distinctive rank, as it is only a part of the seasonal dress. In regard to the extent of the greenish-black colour on the ends of the primaries, I find it varies greatly in different examples from the same country. Thus, one in the Paris Museum, from the Cape of Good Hope, has the end of the first primary greenish black for $1\frac{3}{4}$ inch; while another, from Sumatra, in the same collection has the first primary covered for $3\frac{1}{4}$ inches from the tip with the same colour. In the face of such facts, and with specimens before me from Australia, the Moluccas, and Africa, no two of which are exactly alike in their coloration, as above stated, I cannot do otherwise than consider Mr. Gould's bird from Australia the same as the African *I. æthiopica*, and consign his name to the list of its synonyms. Mr. Gould says that in Australia this bird goes in small flocks from five to twenty in number, and frequents the wet hollows of lagoons, and banks of rivers, seeking frogs, newts, and insects. It is wary, and difficult to approach sufficiently near to bring it within shooting-distance.

Mr. Ayres states that this species frequents the Bay of Natal and the mouths of the rivers along the coast, and are very shy. He has seen them in company with Spoonbills and White Herons, sunning themselves on the upper boughs of the mangroves, and at low water feeding on the mud-banks with the Curlews, Egrets, and Herons. When flying they usually form a figure like Swans and Geese. It arrives in the Zambesi region, according to Dr. Kirk, from the north in December, and frequents the sea-coast. He says the flesh is very good eating.

Gould describes the back of the head and neck as crossed by narrow distinct bands of rose-pink, and on the crown of the head is a series of oval spots arranged in the form of a star of the same colour. However, while in some specimens these are conspicuous, in others they are scarcely apparent, and in the dried skins these marks are not visible. As the allied form *I. melanocephala* has also this same style of coloration, as stated by Blyth, it has no specific value.

Head and neck bare of feathers; skin black; tips of the primaries greenish black, varying in extent among individuals on the first primary from 1 inch to $3\frac{1}{4}$ inches. Tertials with open, much lengthened and diminished webs falling over and covering the lower part of the wing, blackish purple. Entire rest of plumage pure white. In some specimens the feathers of the lower part of the neck are lengthened into a tuft. Bill black; iris reddish brown. Legs horn-colour.

Total length 29 to 30 inches; wing 14 inches; tail 6 inches; bill along culmen varying from 5 to 8 inches; tarsus $3\frac{3}{4}$ inches.

Young have the neck covered with short white feathers.

2. IBIS BERNIERI.

Ibis bernieri, Bon. Consp. Gen. Av. (1857) vol. ii. p. 151; Sclat. Proc. Zool. Soc. (1870) p. 382.

Ibis religiosa, Schleg. & Poll. Rech. Faun. Madag. (1868) p. 126.
Geronticus bernieri, Gray, Handl. B. (1871) pt. iii. p. 40.

Hab. Madagascar.

Precisely like the *I. æthiopica* in colour of plumage, but apparently distinct, or at all events a geographical race, distinguished from its near relative by the much less extent of bare skin on the neck and the white iris. Tertials black with a bluish gloss, their webs open and diminished. Entire rest of plumage pure white. Bill black, feet and legs black.

Entire length 26 inches; wing 13½ inches; tail 7 inches; bill along culmen 5⅓ inches; tarsus 3 inches.

3. IBIS MELANOCEPHALA.

Black-headed Ibis, Lath. Gen. Syn. Supp. p. 240.
Tantalus melanocephalus, Lath. Ind. Orn. (1790) vol. ii. p. 709. sp. 21: Wagl. Isis (1829) p. 760.
Ibis melanocephala, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23; id. Ency. Méth. (1823) tom. iii. p. 1150; Wagl. Syst. Av. (1827); Jard. & Selby, Orn. Ill. pl. 120; Bon. Consp. Gen. Av. (1857) vol. iii. p. 151; Schleg. Mus. P.-Bas. (1863) livr. 4, p. 14; Garrod, Proc. Zool. Soc. (1873) pp. 467, 638.
Numenius de Macei, Cuv. Ann. Mus. Hist. Nat. (1805) vol. iv. p. 125.
Ibis leucon, Temm. Plan. Col. no. 481.
Ibis macei, Wagl. Syst. Av. (1827) sp. 3.
Ibis bengala, Cuv. MS. Paris Mus.; Less. Trait. Orn. (1831) p. 568.
Ibis religiosa, Sykes' Cat. p. 188. sp. 1.
Threskiornis melanocephalus, Blyth, Cat. B. Mus. Asiat. Soc. (1849) p. 275; Gray, Gen. B. (1849) vol. iii. p. 567; Jerd. B. Ind. (1864) vol. iii. p. 768. sp. 941; Swinh. Proc. Zool. Soc. (1863) p. 318. sp. 320; Blyth, Ibis (1867) p. 174, (1870) p. 175; Gray, Handl. B. (1871) pt. iii. p. 40. sp. 10222; Holdsw. Proc. Zool. Soc. (1872) p. 479. sp. 290; Legge, Ibis (1875) p. 404.
Ibis propinqua, Swinh. Ibis (1861) p. 261; id. Proc. Zool. Soc. (1870) p. 428, (1871) p. 44.

Hab. India generally; scarce in Arakan (*Blyth*); Java (*Schlegel*); Ceylon (*Holdsworth*).

I place the *Ibis propinqua*, Swinhoe, as a synonym of *I. melanocephala*, as I do not perceive in his description (*l. c.*) any difference from the present species to entitle it to a separate specific rank. The "pectoral feathers, long and pointed like in *Herodias garzetta*," I do not consider of any specific value, as I find specimens of *I. melanocephala*, from Bengal and Pondicherry respectively, in the Paris Museum, with these lengthened feathers as well as without them, the one from Bengal having them very long and conspicuous, the other not having a trace of them. The latter specimen is Cuvier's type of *Ibis bengala* (MS. Mus. Paris); the former is marked as *Ibis macei*, Wagler. These feathers are assumed in the breeding-season, as stated by Blyth, and therefore cannot be accepted as indicating a

character sufficient to establish a species. In the Pondicherry example the desiccated plumes adorning the back are of a pale pearly white, indeed almost white, agreeing with Swinhoe's bird, which shows that this species varies in the colour of these plumes among individuals. I have never seen these feathers of the rich dark hue exhibited by *I. æthiopica*. Swinhoe speaks of Jerdon's description of *I. melanocephala* as showing that bird to have "black quills." It is true that Jerdon speaks of the "quills black with green reflections;" but this is evidently an error that he inadvertently made, because, lower down the page, he compares the present species with the *I. æthiopica* (as *I. religiosa*), and states they differ in the colour of their quills, the present species having the "apical portion hardly blackish, whilst in *I. religiosa* they are greenish-black." He might have said that the *I. melanocephala* when fully adult had the quills pure white.

Blyth states that occasionally the bare neck of this species is coloured behind like that of *I. strictipennis* (*I. æthiopica*), as figured by Gould in the 'Birds of Australia;' and also, contrary to what is stated by Mr. Gould, this species differs from *I. æthiopica* and resembles the Australian *I. strictipennis* in having the *long pectoral plumes when in breeding-dress*. The naked portion of the neck is considerably less extended than in *I. æthiopica*.

Head and neck denuded of feathers, skin black, occasionally with reddish bars across the back of neck. Scapulars and tertials with open lengthened barbs, rather thin in substance, and falling over the wing; the colour of these varies in individuals from a pearly white to almost a black shade. Rest of plumage and wings pure white. In the breeding-season the lower feathers of neck in front are much lengthened. Bill black; feet black. Total length about 29 inches; wings 14 inches; tail 5 inches; bill along culmen $6\frac{3}{4}$ to $7\frac{1}{2}$ inches; tarsus 4 inches.

Young.—The head and neck covered with short feathers, at first dark brown, then white; and the lengthened scapulars are absent.

4. THAUMATIBIS GIGANTEA.

Ibis gigantea, Oustalet, Bull. Soc. Philomat. (1877) sér. 7, tom. i. p. 25.

Hab. Cochin China.

This fine species was sent to the Paris Museum by M. Harmond from Cochin China. There was only one skin, and that of a bird not in adult plumage. It is remarkable for its great size, approaching to that of the species of *Tantalus*. In fact it is a bird with the body of a *Tantalus* and the bill, legs, and feet of an *Ibis*. It is difficult to tell by the present specimen what would be the colours of the adult plumage; but the wing would apparently be for the greater part a silvery grey. It forms a seeming link between the genera *Tantalus* and *Ibis*; and as it obviously cannot be placed in any existing genus, I propose for it the term *Thaumatibis*, with the following characters:—

Head large, skull almost square on top, which, together with the

neck, is bare. Body large, heavy. Wings reaching to near the end of the tail. Bill curved; nostrils basal, placed in a groove. Middle toe three fourths the length of tarsus; outer toe longer than inner.

Head and upper part of neck bare, crossed on the back of neck by numerous black bars. Lower part of neck covered with short dark greenish feathers edged with grey. Back dark brown glossed with green. Scapulars dark brown, webs disunited. Secondaries, tertials, and greater wing-coverts silvery grey, blackish brown along the shaft of the feathers, and tipped with the same. Primaries brownish black. Underparts dark greyish brown in the central portion of breast, dark green on the flanks. Tail and under tail-coverts dark green. Bill dull red. Feet and legs Indian red.

Total length 42 inches; wing $21\frac{1}{3}$ inches, tail 11, bill along culmen $9\frac{1}{2}$, tarsus $4\frac{1}{3}$, middle toe $3\frac{1}{4}$, the nail $\frac{1}{4}$, hind toe $1\frac{1}{2}$.

5. GRAPTOCEPHALUS DAVISONI.

Geronticus davisoni, Hume, Str. Feath. vol. iii. (1875) p. 300.

Ibis davisoni, Oust. Bull. Soc. Philomat. Paris, 7me sér. tom. i. p. 28 (1877).

Hab. Pakchan estuary, Tennasserim Provinces (*Davison*); Ajudhja, Siam (*Bocourt*); Sombor, Camboja (*Harmond*).

This fine and very distinct species was first described by Mr. Hume (*l. c.*) from two specimens obtained by his collector, Mr. Davison, on the banks of the Pakchan estuary, in the extreme south of the Tenasserim Provinces. Specimens are in the Museum of Paris, brought at different times by MM. Bocourt and Harmond from Siam and Camboja. As stated by Mr. Hume, in coloration of plumage this species is almost exactly like the *Ibis papillosa*, Temminck, with which it has been confounded, although the wings and tail of the Siamese examples are a deeper blue than is seen in specimens of *I. papillosa*. The chief differences between the species are the entire absence of papillæ or warts upon the back of the head, the anterior portion alone being covered with small brown warts, and the peculiar coloration of the bare skin of the head and neck. This in the *G. davisoni* is black on the top and sides of the head; and (as indicated in the skin, which, when moistened, exhibited the colours) between this and the feathers of the neck is a broad band of rose-colour, which extends upwards onto the back of the head in a triangular shape, the point reaching to the level of the top of the head, where it is strongly tinged with blue. The black of the throat is concave-shaped at bottom, and curves upwards and inwards on the side of the neck, to and above the ears, and then is divided on the back of the head by the red colour mounting upward. Mr. Hume says that in his specimens this part of the throat is encircled by a broad *white* band, which becomes blue upon the occiput, and makes no mention of any red or rose-colour; nor does he state whether he was furnished by Mr. Davison with the colour of this naked part, as he describes it, or observed it on the skin of the prepared specimens. I do not suppose that there are two species; for one specimen in the Museum has an indication of a white ring on the neck; but I should be inclined to

believe, judging from the examples I have seen, that the Siamese birds, when alive, have very little white on the neck, the indication mentioned above being possibly caused by the rose-colour having entirely faded out. There was, unfortunately, no description of the colours of the naked skin sent with the specimens. The neck and upper part of the body is rufous brown, glossed with greenish bronze. Upper tail-coverts dark blue with green reflections on the edges of the webs. Scapulars like the back, some of the feathers having the webs disunited and open. Primaries and wings very deep rich Prussian blue, the lesser coverts white. Tail Prussian blue, with a green gloss on the edge of the feathers. Underparts rufous-brown, glossed with green. Under tail-coverts green, with a blue tinge. Bill, according to Hume, "very dark plumbeous, blue at base, shading to a dull ochraceous clay colour towards the tips." In the specimens before me it is apparently dark green, lightest at the tip. Legs and feet coral red. Hume gives the irides as "bright orange." Total length 33 inches; wing 16½, tail 8, bill along culmen 6½, tarsus 3 inches. Another specimen, also brought by M. Harmond from Camboja, measures as follows:—total length 37 inches; wing 16½, tail 9, bill along culmen 7¾, tarsus 3¼ inches. It appears to be a larger and stouter species than the *I. papillosus*. The sexes unfortunately are not indicated in any of the specimens. There are such trenchant differences exhibited by this species from all others of this group of birds, especially in the shape of its skull, which resembles somewhat of that its gigantic relative the *Thaumatibis gigantea*, that it would seem to be entitled to a separate generic rank, and I therefore propose to call it

GRAPTOCEPHALUS,

with the following characters:—

Head and neck bare, covered by a variously coloured skin. Skull square-shaped on top; occipital region high and wide, sloping to the forehead, which is prominent and descends rapidly to the maxilla. Secondaries are equal in length to the primaries, and both reach nearly to the tips of the rectrices. Second and third primaries equal and longest. Tarsus half an inch longer than the middle toe; outer toe slightly longer than inner. Tarsi covered with small hexagonal scales. Under tail-coverts extending over two thirds the length of the tail.

I could not remove the skull, and therefore am only able to describe the form as it appears in the skin.

6. CARPHIBIS SPINICOLLIS.

Ibis spinicollis, Jameson, Edinb. New Phil. Journ. No. 37, p. 213; Jard. & Selb. Ill. Orn. vol. iv. pl. 17; Schleg. Mus. Pays-B. (1863) livr. 4, p. 12.

Ibis lamellicollis, La Fres. Mag. Zool. (1836) p. 1, pl. 57.

Geronticus spinicollis, Gray, Gen. Birds (1847) vol. iii. p. 567, sp. 3; Gould, B. Austr. vol. vi. pl. 45; Gray's Hand-l. B. (1871) pt. iii. p. 39.

Carphibis spinicollis, Reich. Nov. Syn. Av. (1851) pl. 82.

fig. 1009, 1010; Bon. Consp. Gen. Av. (1857) vol. iii. p. 152; Gould, Handb. B. Austr. (1865) vol. ii. p. 282.

Ibis strictipennis, Straw-throated Ibis, d'Albertis (quoted by Sclater), Ibis (1876) p. 361.

Hab. Australia. New Guinea.

This bird is peculiar among the members of this family in possessing the curious straw-coloured spines at the base of the neck in front, as though they were the stiffened shafts of feathers denuded of their webs and massed together. Both sexes apparently are thus adorned, though the spines are more slender and shorter in the female. This species is accustomed to congregate in immense flocks, and is seemingly distributed all over Australia; and, under the name of *Ibis strictipennis*, M. d'Albertis states that he saw it flying over him in New Guinea, of which country it is not at all unlikely to be an inhabitant.

Head, throat, and upper part of neck in front bare, skin black. Feathers of neck short, downy, and end in a point at base of occiput. Sides of neck white, back of neck black, this colour gradually lessening in width as it proceeds towards the occiput. Front of neck and breast covered with short stiff straw-coloured spines, which fall over the breast in front. Back and upper part of breast bright bronze-green with rich purple reflections. Secondaries dark purplish brown, with bright purple bronze spots along the edge of outer webs. Shoulders metallic green, succeeded by a patch of metallic blue, the feathers crossed by narrow bars of velvet black. Greater wing-coverts, and outer webs of tertials, purple bronze. Tail and entire underparts pure white. Bill black. Thighs crimson, graduating into blackish brown on the tarsi.

Immature birds have not the spines at all, or only just commencing to show, and the green on the breast is divided by the white of the lower parts, which is extended up to the neck.

Total length 32 inches; wing $14\frac{1}{4}$, tail $6\frac{1}{2}$, bill along culmen $6\frac{3}{4}$, tarsus $3\frac{1}{2}$ inches.

7. Inocotis papillosus.

Ibis papillosa, Temm. Pl. Col. no. 304; Less. Trait. Orn. (1831) p. 568. sp. 12; Sykes, Proc. Zool. Soc. (1832) p. 162. sp. 190; Burgess, Proc. Zool. Soc. (1857) p. 74; Schleg. Mus. Pays-B. (1863) livr. 4, p. 11.

Ibis papillata, Wagl. Syst. Av. (1827) sp. 10; id. Isis (1829) p. 761.

Inocotis papillosa, Reich. Nov. Syst. Av. (1851) pl. 140. fig. 533; Bon. Consp. Gen. Av. (1857) vol. iii. p. 153.

Geronticus papillata, Wagl. Isis (1832) p. 1232.

Geronticus papillosus, Blyth, Cat. B. Mus. Asiat. Soc. (1849) p. 275. no. 1621; Gray, Gen. B. (1849) vol. iii. p. 567; Jerd. B. Ind. (1864) vol. iii. p. 769; Beavan, Ibis (1868) p. 400; Gray, Handl. B. (1871) pt. iii. p. 39.

Hab. India generally (*Blyth*).

Lieut. Burgess states that in the Deccan this species is much more

common than the Black-headed Ibis (*I. melanocephala*), and frequents open places together with the sandy shores of streams. They go in flocks, and feed chiefly on insects, as the stomach of one which was shot contained only heads, legs, and wing-cases of locusts; that of another was full of large grasshoppers and a lizard, while a third contained the chrysalides of butterflies. This bird roosts in trees, and breeds in the months of February, March, April, May, and June, and lays three or four pale bluish-white eggs, slightly streaked and spotted with brown, $2\frac{4}{10}$ in. in length by $1\frac{7}{10}$ in. in width. Captain Beavan procured it in the Maunbhoom district at Makun, near Ambekanugger, and also saw it at Julpigoorie, where it was deemed very fair eating, and therefore often shot.

Head and throat nude, skin black. A triangular patch of bright red papillæ on the back of the head, reaching above the eyes. Neck and upper parts fuscous brown, with a bronze-green gloss on the back. Wings shining steel-blue. A conspicuous white patch on the inner lesser coverts. Tail steel-blue, not so dark as the wings, with green reflections. Lower parts fuscous brown, under tail-coverts bronze-green. Bill greenish lead-colour; iris dull orange-red; legs and feet brick-red. Total length 30 inches; wing 18, tail 8, bill along culmen $6\frac{1}{2}$, tarsus 3.

8. COMATIBIS COMATA.

Ibis (*Geronticus*) *comata*, Rüpp. Syst. Uebers. (1845) t. 45; Blanf. Zool. Abyss. (1870) p. 436. sp. 278.

Geronticus comatus, G. R. Gray, Gen. B. (1847) vol. iii. p. 567. sp. 13; Heugl. Syst. Uebers. Vög. Nordost-Afr. (1855) p. 313. sp. 636; Tristr. Ibis (1860) p. 78. sp. 127; Gray Hand-l. (1871) pt. iii. p. 40.

Comatibis comata, Reich. Nov. Syn. Av. (1851) pl. 291. figs. 2383, 2384; Bon. Consp. Gen. Av. (1857) vol. iii. p. 153.

Ibis comata, Schleg. Mus. Pays.-B. (1863) livr. 4, p. 9; Heugl. Ornith. Nordost-Afr. (1873) Band ii. Abth. 2, p. 1144.

Hab. North-east Africa, Abyssinia, Algeria.

The Rev. H. B. Tristram met with this species in Algeria beyond Bou Guizoun, on the road to El Aghouat. It appeared to prefer arid mountain-ranges, and consorted with the Raven and Falcon. Its food consisted of lizards and serpents; and it breeds in inacessible holes of precipices. A coarse egg of a deep blue colour, about the size of that of a common Heron, was shown to him as belonging to this species. It did not appear to be gregarious. The legs and feet are peculiarly coarse and rough, adapted rather for rocks and sand than mud and water. According to Blanford this species did not seem to be common in Abyssinia on the route traversed by him, as he only met with it twice, once near Senafé, and again a large flock near Antale. Von Heuglin met with it in winter on the coast of Abyssinia, and in February in large flocks on the high plains of Woggara, together with the *Bostrychia carunculata*. It seems to breed there.

Top, sides of head, and upper part of throat bare of feathers;

skin brilliant crimson. Back of head and neck covered with long loose feathers, dark purple with green reflections. Back, wings, and tail dark greenish-bronze with a large patch of red bronze upon the shoulder. Primaries dark green. Entire underparts very dark greenish-bronze, almost black. Legs and feet bright red. Bill crimson. Total length 29 inches; wing 16, tail 8, bill along culmen 5, tarsus 3.

The young has all the face covered with dirty-white feathers, changing to slate-grey upon the lower part of the neck.

9. GERONTICUS CALVUS.

Courly à tête nue du Cap de bonne Espérance, Buff. Pl. Enl. no. 867.

Tantalus calvus, Bodd. Tabl. Pl. Enl. d. D'Aub. (1783) p. 52; Lath. Ind. Ornith. (1790). vol. ii. p. 708. sp. 17.

Black Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 112. sp. 11.

Bald Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 116. sp. 16.

Tantalus niger, Gmel. Syst. Nat. (1788) p. 650. sp. 14; Lath. Ind. Orn. (1790) vol. ii. p. 707. sp. 13; Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 21.

Ibis calva, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23; id. Ency. Méth. (1823) tom. iii. p. 1150; Wagl. Syst. Av. (1827) sp. 11; id. Isis (1829) p. 761; Schleg. Mus. P.-Bas (1863) livr. 4, p. 11.

Ibis gonocephala, Wagl. Isis (1829), p. 761.

Geronticus calvus, Wagl. Isis (1832) p. 1232; Gray, Gen. Birds (1849) vol. iii. p. 567. sp. 2; Bon. Consp. Gen. Av. (1857) vol. iii. p. 153; Gurney, Ibis (1860) p. 219. sp. 116; Layard, B. S. Afr. (1867) p. 321. sp. 606; Gray, Hand-l. B. (1871) pt. iii. p. 39; Gurney, B. Damara L. (1872) p. 297.

Hab. South Africa (*Layard*), Orange River, Damara Land (*Andersson*).

This species was named by Boddaert (*l. c.*) *Tantalus calvus*. It is true that Forster in his 'Descriptiones Animalium' gave the name of *capensis* to the same bird; but as this does not appear to have been published by the author, and was unrecognized until Lichtenstein issued his edition in 1844, Forster's name will of course sink into a synonym.

According to Mr. Ayres this species feeds entirely on insects, chiefly beetles. They frequent the land from which the grass has been burnt, and are very wary, being constantly on the move all day. Although living inland, during the winter months they approach within ten miles of the coast. Steedman states that this Ibis nests in companies in the clefts of the sides of precipices. In this respect it resembles the *G. comatus*. Layard says that the Bald Ibis, known to the Dutch colonists as the *Wilde Kalkoen* (wild Turkey), is not rare on the eastern frontier, but not often found on the western. He understood that it was a very foul feeder, frequenting the vicinity of villages and acting the part of a scavenger. One that Sir George Grey had in captivity walked very rapidly, and was always occupied in

seeking for food, probing the ground with its bill, and drawing out the earth-worms, which it swallowed at a gulp. Mr. Vigne shot this species at Tygerhoek, near Caledon, on the river Zouder End.

Layard says that the bare portion of the neck is of a deep *red colour*, while Mr. Ayres, as quoted by Gurney (Ibis, 1860, p. 209), states that this part is *greenish white*, the top of the head only being bright red. From the dried skin it is difficult to ascertain which is correct; but I have followed Mr. Ayres, thinking that perhaps his opportunities of examining the bird in the flesh have been greater than those of Mr. Layard.

Top of the head bare, bright red; neck and throat in front denuded of feathers, skin greenish white. Entire plumage rich bronze-green, with the exception of a large patch upon the shoulders of a reddish bronze, violet in certain lights. Legs and feet red. Bill red. Total length 32 inches; wing 16, tail 9½, bill along culmen6, tarsus 2¾.

10. PHIMOSUS INFUSCATUS.

Curucán afeytado, Azara, Apunt. Hist. Nat. Parag. (1802–5), no. 365, p. 201.

Ibis infuscata, Licht. Doubl. (1823) p. 75; Schleg. Mus. P.-Bas (1863) livr. 4, p. 8; Wyatt, Ibis (1871) p. 384.

Ibis nudifrons, Spix, Av. Bras. t. 86 (1825); Wagl. Syst. Av. (1827) sp. 6; Less. Trait. Orn. (1831) p. 567.

Phimosus infuscatus, Wagl. Isis (1832) p. 1232; Bon. Consp. Gen. Av. (1857) vol. iii. p. 156; Sclat. & Salv. Nomen. Av. Neotr. (1873) p. 127.

Geronticus infuscatus, Gray, Gen. Birds (1849) vol. iii. p. 566. sp. 16; id. Hand-l. Birds (1871) pt. iii. p. 41.

Hab. South America, from Columbia to the Argentine Republic.

The present bird was first described by Lichtenstein (*l. c.*). The manner in which the fore part of the head and the throat are denuded of feathers, as well as its small size, make it easily distinguishable from its relatives. Its range is quite extensive, as it is an inhabitant of South America, from Columbia to the Argentine Republic. There is no difficulty with the synonymy, as but one additional name seems to have been given it, viz. *nudifrons* of Spix.

Fore part and sides of head, and throat, red. Plumage of body dark-green bronze glossed with purple. Secondaries, primaries, and rectrices bright bronze green. Bill, legs, and feet red.

Total length 24 inches; wing 11½, tail 6, bill along culmen 5¼, tarsus 2¼.

11. NIPPONIA NIPPON.

Ibis nippon, Temm. Pl. Col. (1835) no. 551; Schleg. Faun. Jap. t. 71; id. Handl. Dierk. t. vii. p. 84; id. Mus. Pays-Bas (1863) livr. 4, p. 9; Blakiston, Ibis (1862) p. 331; Swinh. Proc. Zool. Soc. (1863) p. 318. sp. 321; id. Ibis (1863) p. 416, (1873) p. 249, (1875) p. 455; David, Nouv. Archiv. Mus. Paris (1867) Bull. p. 39;

Von Homeyer, Journ. für Ornith. (1870) p. 427; Taczan. Journ. für Orn. (1875) pp. 256–8.

Nipponia temmincki, Reich. Syn. Av. pl. 141. fig. 538.

Nipponia nippon, Bon. Consp. Gen. Av. (1857) ii. p. 152.

Ibis (*Geronticus*) *nippon*, Radde, Reise im Süd. v. Ost-Sib. (1863) p. 341.

Geronticus nippon, Gray, Hand-l. B. (1871) pt. iii. p. 40. sp. 10232.

Ibis sinensis, David, Compt. Rend. (1872) p. 64; Oust. Bull. Nouv. Archiv. Mus. Paris (1872) p. 129, pl. 6.

Hab. Japan; China, near Shanghai; Ningpo, North Formosa (*Swinhoe*); Siberia (*Radde*).

Swinhoe, who saw this species in Formosa, says that they are not regular in their visits to that island; but he has frequently observed about the end of April some half dozen of these birds on the river-shoals at Tamsuy. They did not seem to breed in Formosa. The birds of the year were a smoke-grey, deep on the head and neck, and nearly white on the wings and underparts. He also met with them at Ningpo, and gives in 'The Ibis' a full account of the species from his observations of it while there. On December 31st, 1872, a pair flew over him; and the male, perched in a lofty pine, kept throwing his head forward and uttering his love-note of *now, now* in a loud hoarse voice. In April they commenced putting on their dark breeding-feathers. On the 10th of June a live bird of the year, in grey plumage, was brought to him. It was very tame, refused fish, but eat raw beef. The cheeks and over the eye were covered with downy feathers; but the rest of the face was bare, and orange-yellow in colour instead of red. Irides light yellowish brown; legs and feet light brown, with a tinge of orange-flesh-colour. It had a full occipital crest, and delighted to expand it. On the 23rd of August he saw large parties of this Ibis on a lake, white birds and dusky ones in company. He visited the same lake again on November 18th, and saw large flocks of these birds; but then they were all white and rose-coloured, no grey ones among them. The lake-dwellers call them *Houg* (red) *le*. A large party of Ibis settled near him in the muddy water, where it was up to their tarsal knees. After remaining still for a few moments they advanced, jerking their bills about in every direction under water. They probably felt their prey, and every thing caught was thrown into the throat by a few nods of the head. Their captures were small fishes, as was ascertained by dissection. When tired or satisfied each one flew to a ridge of earth near by, stretched himself, yawned, preened his feathers a little, and, sinking to the usual contracted position, remained quite still. When approached they sprang at once into the air from their crouching attitude, their wings glowing as if under a rising or setting sun, their bills chattering and uttering a *gaw*-like murmur, mingled with guttural cries like *gok, gok*. They fly steadily, the legs stretched out behind, reaching just beyond the tail, the head full forward, the bill and forehead looking black. The Rosy Ibis breeds in company, but often in pairs by themselves, and have eggs in January,

when the ground is frozen and often covered with snow. The young are fully fledged and have the appearance of adult birds by April. They retain their grey plumage throughout the summer, and moult about October.

In a male of the year the proventriculus was granulated beneath the outer surface, 1⅜ inch long, ·9 at broadest; stomach of an irregular oval, with strong lateral tendons and gummy adnate epithelium, 2¾ inches long by 2¼ broad, full of half-digested little fish and a few small shrimps; intestine white, ·2–·4 thick, about 6 feet long, with cæca 3 inches from the anus, the right one about ·4 long, the left little more than a pimple; testes small and bluish black, the left twice the size of the right. The flesh cooked was coarse and fishy. An adult male had testes much larger, unequal in size, and ochraceous yellow. The whole of the flesh, fat, cartilage, and bone was saturated with the vermilion tint that appears on the wings and soft external parts of the birds. The trachea was 6½ inches, consisting of a series of rings close together, broad on one side, narrow on the other, until just before reaching the bronchi, when four or five uniform rings occur ending in a projecting semicircle of bone as thick as two of the broad parts of the upper rings; below this two crescentic bony ridges commenced the short bronchi. The trachea averages ·5 inch in breadth, becoming narrower towards its end. The tongue is short, ·6 inch, triangular, with a concave papillose base; the hyoids thick and curved, the first joint 1·4 inch, the second ·8 long. The eggs measure from 2 inches in length by 1·25 in breadth to 2·6 by 1·6. They were pale bluish green in colour, and had a rough surface.

I have examined the specimens obtained by Père David at Choléang, Province of Tchakiang, and named by him (*l. c.*) *Ibis sinensis*; and I agree with M. Oustalet (*l. c.*) that they are only the young of the present species,—young of the year, which have not altogether assumed the adult dress, the grey or plumbeous colour still lingering upon the upper portions of the wings, mantle, and neck.

The plumage of the adult is a beautiful rosy white. The shafts of the feathers of the wings and tail are pale vermilion, and the webs rose-colour. A long pendent open crest flows from the back of the head; top of head and face bare of feathers; skin bright red; bill black, its tip vermilion; legs and feet Indian-red; iris vermilion. Total length 31 inches; wings 16½, tail 6½, bill along culmen 6½, tarsus 3½.

Young.—Cheeks and over the eyes covered with downy feathers, rest of face bare, orange-yellow; general plumage dusky cream-colour, glossed with rose-colour; primaries blackish brown; legs and feet light brown; irides light yellowish brown.

12. Cercibis oxycerca.

Ibis oxycerca, Spix, Av. Brasil. (1825) pl. 87, p. 69.
Cercibis oxycercus, Wagl. Isis (1832) p. 1232.

Hab. Brazil, river Amazons, westward to Bogota.

This is a scarce species in collections, and was first described by

Spix (*l. c.*) from Brazil. A specimen in Messrs. Salvin and Godman's collection, obtained in the vicinity of Bogota, would seem to show that it ranged nearly across the continent. It is a bird of rather dull plumage, having but little of the metallic coloration which renders many of the species of this group so beautiful. I have not been able to learn any thing regarding the economy or habits of the species.

Sides of head, including the eye and throat, bare of feathers, skin red; general plumage very dark olive-green, with purple reflections on the neck; wings dark olive-green, primaries dark rufous brown, secondaries dark purple; tail dark grass-green, with blue reflections. Total length, without bill, 27 inches; wing 16, tail $11\frac{1}{2}$, bill along culmen $6\frac{1}{2}$, tarsus $2\frac{1}{2}$.

13. THERISTICUS CAUDATUS.

Courly à col blanc de Cayenne, Buff. Pl. Enl. no. 976.

Scolopax caudatus, Bodd. Tabl. Pl. Enl. Daub. (1783) p. 57.

Black-faced Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 108, pl. 79.

White-necked Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 109. sp. 6.

Tantalus melanopis, Gmel. Syst. Nat. (1788) p. 653. sp. 19; Lath. Ind. Orn. (1790) vol. ii. p. 704. sp. 8.

Tantalus albicollis, Gmel. Syst. Nat. (1788) vol. i. p. 652, sp. 20, juv.; Lath. Ind. Orn. (1790) p. 904. sp. 6; Vieill. Enc. Méth. (1823) tom. iii. p. 1146.

Mandurrea ó curucáu, Azara, Apunt. Hist. Nat. Parag. iii. p. 189. sp. 5.

Ibis albicollis, Vieill. Nouv. Dict. Hist. Nat. (1819) vol. xvi. p. 17, juv.; Less. Trait. Orn. (1831) p. 567, sp. 7.

Ibis melanopis, Vieill. Nouv. Dict. Hist. Nat. (1819) vol. xvi. p. 20; *id.* Ency. Méth. (1823) tom. iii. p. 1148; Wagl. Syst. Av. (1827) sp. 17; Darw. Voy. Beag. vol. iii. p. 128; Schleg. Mus. Pays-Bas (1863) livr. 4, p. 7; Sclat. & Salv. Proc. Zool. Soc. (1869) p. 600; Hudson, Proc. Zool. Soc. (1872) p. 549.

Theristicus melanopis, Wagl. Isis (1832) p. 1232; Bon. Consp. Gen. Av. (1857) vol. iii. p. 155; Cunningh. Ibis (1868) p. 126; Newton, Ibis (1870) p. 502; id. Proc. Zool. Soc. (1870), p. 56, pl. iv. fig. 8 (egg); Taczan. Proc. Zool. Soc. (1874) p. 562.

Theristicus melanops, Fraser, Proc. Zool. Soc. (1843) p. 117.

Theristicus albicollis, Bon. Consp. Gen. Av. (1857) vol. iii. p. 154. sp. 2.

Vanduria de Inverno, Hudson, Proc. Zool. Soc. (1871) p. 261.

Hab. Chili (*Bridges*); Pitumarca, Peru (*Whitely*); Buenos Ayres (*Hudson*); Rio Negro (*Hudson*); Straits of Magellan (*Cunningham*).

Mr. Hudson states that this bird appears in May in Buenos Ayres, and is very common on the pampas about latitude 38°. It frequents dry ground, covered with loose grass or low cardoon bushes, and feeds in flocks of from forty to fifty individuals. They swallow the larvæ of the large horned beetle, quantities of which insect are often found in their stomachs. About sunset they take wing, uttering loud cries,

and seek the nearest watercourse. When flying they frequently make eccentric evolutions, the entire flock descending with great rapidity, each individual wheeling about in a zig-zag course. In this manner they go on for some time, screaming loudly all the while. Their flight is swift and easy, and on the arrival of spring they depart for the south, making their summer resort probably in the northern part of Patagonia. This Ibis was observed, however, in the Straits of Magellan by Dr. Cunningham in various localities during the months of December, January, and February. It was shy and wary, flying in flocks of from four to eight, and had a cry resembling *qua-qua, qua-qua*. It was found rather good eating. In a female he procured he found the sternum had a very deep keel, and the scapulæ were broad. The portion of the trachea below the insertion of the sterno-tracheal muscles, though presenting no striking peculiarity of form, had the bony rings ankylosed so as to form an immovable tube. The stomach was crammed with worms and large larvæ. An egg obtained at Elizabeth Island was 2·71 × 1·86. "Dull surface, of a pale greenish white, with engrained blotches (mostly small) of neutral tint, and some few blotches, spots and specks of deep dull brown; towards the larger end some hair-like streaks of a lighter shade of the same, and so far having an Ibidine or Plataleine character; but at first sight the egg looks as if it might have been laid by an exhausted Gull." This resembles the egg described by Mr. Darwin (*l. c.*).

This species is known generally to ornithologists as *Ibis* (*Theristicus*) *melanopis*, the name given to it by Gmelin. This, however, is antedated by Boddaert, who conferred upon the *Courly à col blanc de Cayenne* of Buffon (*l. c.*) the appellation *Scolopax*! *caudatus*, which, having priority over all others, must be the one for the species to bear in future.

Sides of throat, and lores bare, skin black; top of head and lower part of neck in front reddish chestnut; neck white, a narrow line of feathers running up the centre of the throat to the chin; back and wing greyish brown, with green reflections, feathers edged with light brown or whitish; tertials and outer webs of secondaries for two thirds their basal length white, remainder dark green; primaries dark green; rump and upper tail-coverts light bronzy green; tail dark bronze-green; underparts brownish black with green reflections. Total length 33 inches; wing 16¼, tail 9¾, bill along culmen 7, tarsus 3½.

14. LOPHOTIBIS CRISTATA.

Le Courlis huppé, Buff. Plan. Enlum. no. 841.

Tantalus cristatus, Bodd. Tabl. Pl. Enl. Daub. (1783) p. 51; Gmel. Syst. Nat. (1788) vol. i. p. 652. sp. 13; Lath. Ind. Orn. (1790) vol. ii. p. 709. sp. 20.

Ibis cristata, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvii. p. 19; id. Ency. Méth. (1823) tom. iii. p. 1148; Wagl. Syst. Av. (1827) sp. 13; Schleg. Mus. P.-Bas (1863) livr. 4. p. 6; id. Proc. Zool. Soc. (1866) p. 425; Schleg. & Poll. Recher. Faun. Madag. (1868) p. 127.

Lophotibis cristatus, Reich. Nov. Syn. Av. (1851) pl. 83. fig. 637; Bon. Consp. Gen. Av. (1857) p. 154.

Hab. Madagascar.

This is one of the very handsomest members of this subfamily. It is a native of Madagascar, and has been known to ornithologists for nearly one hundred years. It is too conspicuous a bird, and has too many and striking peculiarities to permit it to be confounded with any of its relatives; consequently its synonymy is simple, no second name having been given to it. Like so many of the *Ibidinæ*, it apparently belongs to a distinct genus, of which it is as yet the only representative.

Head—forehead metallic green; top of head covered with long crest-feathers, white with dark chestnut tips, some of the most lengthened feathers wholly white; a full lengthened metallic green nuchal crest springs from beneath the white ones just mentioned, and is continued by the feathers of the neck of the same colour nearly to the mantle; bare space around the eye bright red; cheeks brownish; chin, throat, and sides of neck blackish brown; back, breast, and underparts reddish chestnut; wing white; scapulars reddish brown; rump dark green, almost black; tail dark blue with green reflections; flanks and thighs bronzy green; bill olive-green?, brownish towards the tip; legs and feet bright red.

Total length 26 inches; wing 14, tail $7\frac{1}{2}$, bill along culmen $5\frac{1}{2}$, tarsus $2\frac{3}{4}$.

15. HAGEDASHIA CHALCOPTERA[1].

Tantalus hagedash, Lath. Ind. Orn. (1790) vol. ii. p. 708. sp. 23.

Ibis hagedash, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 19; id. Ency. Méth. (1823) tom. iii. p. 1147; Wagl. Syst. Av. (1827) sp. 16; id. Isis (1829) p. 760; Less. Trait. Orn. (1831) p. 567. sp. 8; Schleg. Mus. P.-Bas (1863) livr. 4, p. 10; Finsch & Hartl. Vög. Ost-Afr. (1870) p. 735; Heugl. Ornith. Nordost-Afr. (1873) Band ii. Abth. 1, p. 1141.

Ibis chalcoptera, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 9; id. Ency. Méth. (1823) tom. iii. p. 1144; id. Gal. Ois. (1834) pl. 246; Wagl. Syst. Av. (1827) sp. 9.

Geronticus hagedash, Gray, Gen. Birds (1849) vol. iii. p. 566. sp. 10; Hartl. Syst. Ornith. West-Afr. (1857) p. 231. sp. 656; Brehm, Jour. für Ornith. (1858) p. 330; Gurney, Ibis (1865) p. 274, (1868) p. 260; Layard B. S. Afr. (1867) p. 320. sp. 605; Gray, Hand-l. B. (1871) pt. iii. p. 40; Bocage, Jour. für Ornith. (1876) p. 300.

Harpiprion hagedash, von Heugl. Syst. Uebers. Vög. Nordost-Afr. (1855) p. 313. sp. 635.

Hagedashia caffrensis, Bon. Consp. Gen. Av. (1857) vol. iii. p. 152; Gurney, Anders. B. Damar. Land (1872) p. 298.

[1] Bonaparte (*l. c.*) and some others call this species "*caffrensis*, Licht. Cat. Hamb." Not having been able to examine this book, I do not know whether Lichtenstein's name antedates that of Vieillot, or not.

Hab. Africa, Gambia, Old Calabar (*Jard.*); Mossambique (*Peters*).

Mr. Ayres states that the Caffer Ibis go in families of from four to twelve individuals. They frequent the dense bush when feeding, and are usually very wary. They feed on beetles and other insects, hunting for them in old gardens and other localities where these are most abundant. Their notes are loud and harsh, and in still weather can be heard for a considerable distance. They generally roost in high trees overhanging the water; and the nest, which is built of coarse sticks and lined with fine grass, is placed upon a bough. It is made just large enough to keep the eggs from rolling out. In the colony of Natal these birds are becoming very scarce, as when properly cooked their flesh is very good, and great numbers are killed. Dr. A. Brehm, who met with this species in Sennaar, gives the following account of it in the 'Journal für Ornithologie,' 1858, p. 330:—"Towards evening he begins to think of his night quarters, which are single trees close to the river, or standing on islands. Here he meets his sacred cousin the 'Insatiable' (*Tantalus ibis*), the Marabu, the Spoonbill, one or other of the Pelicans, and similar company, frequently also a troop of monkeys, with whom he vies in roaring till a late hour of the night. A monkey will sometimes amuse himself by trying to catch the Ibis by his tuft, or by otherwise annoying him; then, indeed, he can be heard to roar! He rises, shrieks as if he were spitted, circles round the tree several times, and again sweeps back to his place, when the monkey is perhaps mischievous enough once more to disturb his bedfellow, and the old row begins afresh, although the patriarch of the monkey-herd has several times, with his deep gurgling tones, admonished the offenders to keep the peace."

As this species does not apparently agree with any of the other genera, I have retained for it Bonaparte's term *Hagedashia*; and since the name *chalcoptera* was bestowed upon the species by Vieillot in 1817, that will of necessity become the specific title to be employed.

Top of head, neck, and entire underparts very light brown, feathers edged with white; cheeks and throat dark greyish brown, with a white line beneath and behind the brown on the cheeks, and a naked space upon the lower margin of mandible; upper parts and scapulars yellowish bronzy green; wings pale metallic green, changing to a rose-colour in certain lights; secondaries dark blue; tertials deep blue, their outer webs yellowish bronze, forming a bar beneath the light green across the wings when closed; primaries dark purple-brown; bill black, ridge towards the base crimson; legs and feet dull red.

Total length 26 inches; wing 15, tail $6\frac{3}{4}$, bill along culmen $4\frac{3}{4}$, tarsus $2\frac{1}{2}$.

16. BOSTRYCHIA CARUNCULATA.

Ibis carunculatus, Rüpp. Faun. Abyss. t. xix. (1835); Heugl. Ornith. Nordost-Afr. (1873) Band ii. Abth. 1, p. 1139.

Geronticus carunculatus, G. R. Gray, Gen. Birds (1847) vol. iii. p. 567. sp. 11 ; id. Hand-l. B. (1871) pt. iii. p. 40.

Bostrychia carunculata, Reich. Nov. Syn. Av. (1851) pl. 83. fig. 1011 ; Bon. Con. Gen. Av. (1857) vol. iii. p. 152.

Harpiprion carunculatus, Von Heugl. Syst. Ubers. Vög. Nordost-Afr. (1855) p. 313. sp. 634.

Ibis (*Harpiprion*) *carunculata*, Blanf. Zool. Abyss. (1870) p. 437. sp. 276.

Hab. Abyssinia.

This species is very abundant, according to Blanford (*l. c.*), throughout the higher portions of the highlands of Abyssinia traversed by him. It was common at Senafé, in the swamps and meadows bordering the lake at Ashangi, and especially on the Wadela and Dalanta plateaux. It is met with either solitary or in small flocks, keeps to open meadows or cultivated fields, and feeds on snails, caterpillars, beetles, locusts, &c. Its voice is harsh ; but it seldom utters its cry.

This bird is remarkable for the long wattle that hangs down from the lower part of the throat, and is the only member of this group possessing such a peculiar character. It is the type of Reichenbach's genus *Bostrychia*.

Head, crest, and neck dark brown, the feathers edged with greyish white ; back dark brown, with a slight greenish gloss, feathers edged with light brown ; back and upper tail-coverts pale green-bronze ; wings and scapulars greenish bronze, darker than the rump, with reddish reflections ; secondaries dark green bronze, edges of outer webs with purple reflections ; great coverts white along the shoulder ; those below brownish black, bordered with white ; primaries dark bronze-green ; tail dark bronze-green, the feathers with purple reflections on their edges ; underparts dark olive-brown with green reflections, feathers tipped with greyish white ; under tail-coverts very long, extending two thirds the length of the rectrices, dark green with a purple gloss ; bill dull red, a long narrow red wattle hangs from the lower part of the throat, an inch and three quarters in length in its dried state ; legs and feet red. Total length 25 inches ; wing 14, tail $7\frac{1}{2}$, bill along culmen $4\frac{1}{4}$, tarsus $2\frac{1}{4}$.

17. HARPIPRION CAYANENSIS.

Courly vert de Cayenne, Buff. Pl. Enlum. no. 820.

Cayenne Ibis, Lath. Gen. Syn. vol. iii. p. 107. sp. 3.

Tantalus cayanensis, Gmel. Syst. Nat. (1788) vol. i. p. 652. sp. 17 ; Lath. Ind. Orn. (1790) vol. ii. p. 704. sp. 3 ; Less. Trait. Orn. (1831) p. 567. sp. 2.

Ibis sylvatica, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 16 ; id. Ency. Méth. tom. iii. p. 1146 (1823).

Ibis dentirostris, Wagl. Syst. Av. (1827) sp. 7.

Harpiprion cayanensis, Wagl. Isis (1832) p. 1232 ; Fraser, Proc. Zool. Soc. (1843) p. 117 ; Boie, Consp. Gen. Av. (1857) vol. ii. p. 155 ; Sclat. & Salv. Nomencl. Av. Neot. (1873) p. 127.

? *Ibis cayanensis*, Schleg. Mus. Pays-Bas, liv. iv. p. 8.

? *Geronticus cayanensis*, Gray, Gen. Birds (1847) vol. iii. p. 567; id. Hand-l. B. (1871) pt. iii. p. 40.

Hab. From Panama, through Northern South America to Brazil.

Top and sides of head and throat blackish brown, with a purple tinge; narrow line on forehead and lores bare, skin black; back and sides of neck dark metallic green; back and wings dark bronzy green, with red reflections in certain lights; tail dark green, with blue reflections; primaries deep blue; entire underparts dark bronze-green; bill dark green for two thirds its length from base, pale green for the remainder; legs and feet lead-colour. Total length 22½ inches; wing 13, tail 7¼, bill 5½, tarsus 2½.

18. MOLYBDOPHANES CÆRULESCENS.

Curucáu aplomado, Azara Apunt. Hist. Nat. Parag. y Rio Plata (1802–5) iii. p. 195, no. 363.

Ibis cærulescens, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 18; id. Ency. Méth. (1823) tom. iii. p. 1147; Schleg. Mus. P.-Bas (1863) livr. 4, p. 9; Sclat. & Salv. Proc. Zool. Soc. (1869) p. 635.

Ibis plumbea, Temm. Pl. Col. 235; Wagl. Syst. Av. (1827) sp. 14; Less. Trait. Orn. (1831) p. 567.

Harpiprion plumbeus, Wagl. Isis (1832) p. 1232.

Geronticus cærulescens, Gray, Gen. Birds (1847) vol. iii. p. 567. sp. 9; id. Hand-l. B. (1871) pt. iii. p. 40.

Molybdophanes cærulescens, Reich. Nov. Syn. Av. pl. 291. figs. 2383–84 (1851); Bon. Consp. Gen. Av. (1857) vol. ii. p. 154.

Harpiprion cærulescens, Sclat. & Salv. Nomencl. Av. Neotr. (1873) p. 127.

Hab. Brazil, Conchitas; Argentine Republic (*Hudson*).

This species, the *Curucáu aplomado* of Azara, was described by Vieillot (*l.c.*), and afterwards figured by Temminck under a different name in his 'Planches Coloriées.' It is the type of Reichenbach's genus *Molybdophanes*, and is restricted apparently to Brazil, south of the Amazons, and to the Argentine Republic, where, however, it is not uncommon.

A white bar commences above and behind the eye and covers the forehead. A white line at the base of the mandible. Top of head and lengthened nuchal crest dark brown, with a slight greenish tinge. Throat and neck covered with long narrow feathers, light brown, in certain lights having a pinkish tinge. Upper parts pale bronzy green. Wings like the back; in some lights the feathers have a silvery gloss. Primaries deep blue, greenish towards the edges of the outer webs. Tail dark green. Entire underparts brownish grey, with light pink reflections in certain lights. Bill and bare space in front of the eye black. Legs and feet yellow in the skin.

Total length 33 inches; wings 15½, tail 7½, bill along culmen 6½, tarsus 3½.

19. FALCINELLUS IGNEUS.

Tantalus falcinellus, Linn. Syst. Nat. (1766) p. 241. sp. 2;

Gmel. Syst. Nat. (1788) p. 648. sp. 2; Lath. Ind. Orn. (1790) vol. ii. p. 707. sp. 14.

? *Grey Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 3. sp. 7.

Green Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 114. sp. 13.

Glossy Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 115. sp. 14.

Bay Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 113. sp. 12.

Courlis d'Italie, Buff. Planch. Enl. no. 819.

Tantalus igneus, Gmel. Syst. Nat. (1788) p. 649. sp. 9; Lath. Ind. Orn. (1790) vol. ii. p. 708. sp. 16.

? *Tantalus griseus*, Gmel. Syst. Nat. (1788) p. 653. sp. 21.

Tantalus viridis, Gmel. Syst. Nat. (1788) p. 648, sp. 8; Lath. Ind. Orn. (1790) vol. ii. p. 707. sp. 15.

Tantalus niger, Gmel. Syst. Nat. (1788) vol. ii. p. 650. sp. 14.

Tantalus mexicanus, Gmel. Syst. Nat. (1788) p. 652. sp. 18, juv.; Lath. Ind. Orn. (1790) p. 704. sp. 4; Ord, Journ. Acad. Nat. Scien. Phil. (1817) vol. i. p. 53.

Numenius falcinellus, Pall. Zoog. Rosso-Asiat. (1811) vol. ii. p. 165.

Ibis sacra, Temm. Man. Ornith. (1815) p. 385.

Ibis falcinellus, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23; Temm. Man. Orn. (1820) vol. ii. p. 598, vol. iv. p. 389; Vieill. Ency. Méth. (1823) tom. iii. p. 1143; Wagl. Syst. Av. (1827); Cuv. Règn. Anim. (1829) p. 520; Less. Trait. Orn. (1831) p. 566. sp. 1; Sykes, Proc. Zool. Soc. (1832) p. 162; Nuttall, Orn. U. S. (1834) vol. ii. p. 88; Bon. Comp. List (1838) p. 49. sp. 340; Vigne, Proc. Zool. Soc. (1841) p. 7; Aud. B. Amer. 8vo ed. (1842) vol. vi. p. 50, pl. 358; id. Orn. Biog. vol. iv. p. 608; Savig. Desc. Egypt. Zool. Text, vol. iii. p. 401, Atl. pl. 7. fig. 2; Gray, Gen. Birds (1849) vol. iii. p. 566; MacGill. Brit. Birds (1852) vol. i. p. 493; Hartl. Syst. Ornith. W.Afr. (1857) p. 230. sp. 655; Schleg. Mus. Pays-B. livr. iv. p. 2; Kirk, Ibis (1864) p. 334; David, Nouv. Archiv. Mus. Paris (1867) p. 39; Layard, B. S. Afr. (1867) p. 319. sp. 603; Schleg. & Poll. Rech. Faun. Madag. (1868) p. 128; Von Drost, Journ. für Orn. (1869) p. 342; Hudson, Proc. Zool. Soc. (1870) p. 799; Von Pelz. Reis. Nov. Vög. pp. 125–127; Finsch & Hartl. Vög. Ost-Afr. (1870) p. 730; Gray, Hand-l. B. (1871) pt. iii. p. 39; Gund. Jour. für Orn. (1871) p. 283; Swinh. Proc. Zool. Soc. (1871) p. 411; Shelley, B. Egypt (1872) p. 262; Heugl. Ornith. Nordost-Afr. (1873) Band ii. Abth. 1, p. 1132; Severtz. Jour. für Orn. (1873) p. 385; Ridgw. Am. Nat. (1874) p. 110; Heugl. Jour. für Orn. (1874) p. 400; Ridgw. Ann. N. Y. Lyc. Nat. Hist. (1874) p. 386; Danf. & Brown, Ibis (1875) p. 426.

Tantalides falcinellus, Wagl. Isis (1832) p. 1231.

Tringa autumnalis, Hasselq. It. Pal. deutsche Ausg. p. 306.

Ibis noir, Savig. Hist. Nat. Myth. de l'Ibis, p. 36, fig. 4, juv.

Ibis erythrorhyncha, Gould, Proc. Zool. Soc. (1837) p. 127, juv.

Ibis ordii, Bon. Comp. List (1838) p. 49; Darw. Voy. Beagle (1841) Aves, p. 129; Baird, B. N. Amer. (1860) p. 685; Sclat. Proc. Zool. Soc. (1864) p. 179; Allen, Proc. Essex Inst. (1864)

vol. iv. p. 86; Lawr. Ann. N.Y. Lyc. Nat. Hist. (1866) p. 292; Turnb. Birds E. Penn. (1869) p. 44.

Falcinellus igneus, Gray, Gen. B. 2nd ed. (1841) p. 87; Gould, B. Austr. vol. vi. pl. 47; Blyth, Cat. Birds Mus. Asiat. Soc. (1849) p. 274; Bon. Consp. Gen. Av. (1857) vol. iii. p. 158; Heugl. Syst. Uebers. Vög. Nordost-Afr. (1855) p. 314. sp. 637; Jerd. B. Ind. (1864) vol. iii. p. 770; Gould, Handb. B. Austr. (1865) p. 286; Holds. Proc. Zool. Soc. (1872) p. 479; Sclat. & Salv. Nomen. Av. Neot. p. 126; Bartl. Proc. Zool. Soc. (1875) p. 68; Legge, Ibis (1875) p. 404.

Plegadis falcinellus, Kaup, Fr. Vög. Eur. Taf. 43. fig. 3, p. 378; Fritsch, Jour. für Ornith. (1871) p. 370.

Tantalus bengalensis, Licht. Bon. Consp. Gen. Av. (1857) vol. ii. p. 158.

Ibis peregrina, Müll. Bon. Consp. Gen. Av. (1857) vol. ii. p. 159.

Eudocimus erythrorhynchus, Bon. Consp. Gen. Av. (1857) p. 159.

Falcinellus ordii, Coues, Proc. Acad. Nat. Scien. Phil. (1866) p. 96; Taczan. Proc. Zool. Soc. (1874) p. 562; Gundl. Jour. für Orn. (1874) p. 313.

Falcinellus erythrorhynchus, Gmel. Jour. für Ornith. (1871) p. 285.

Ibis falcinellus, var. *ordii*, Coues, Birds N. West (1874) p. 517.

Eudocimus falcinellus, Bar. du Bocage, Jour. für Ornith. (1876) p. 300.

Hab. Eastern United States, West Indies and Eastern Hemisphere.

There are apparently four species of the so-called Glossy Ibis, so far as our present material enables us to judge, three of which are restricted to the New World, while the fourth, the present species, is an inhabitant of the eastern part of the United States, the West Indies, and is moreover generally distributed throughout the eastern hemisphere. The American *F. igneus* was separated by Bonaparte from the European as *F. ordii*; but there does not seem to be the slightest difference between them, and Bonaparte's name should become a synonym. This bird can be readily distinguished from its relatives when adult by having the top of the head green.

Top of head and sides of face metallic dark green, with purple reflections. Bare space in front of and a little surrounding the eye bluish or slaty blue. Neck, back, and entire underparts dark cinnamon-red, with purple reflections on some of the back feathers. Scapulars and greater wing-coverts metallic purple. Secondaries grass-green, with purple gloss. Primaries dark bronze-green. Rump dark green, glossed with purple. Tail dark green, with purple reflections; undercoverts purple. Bill black, bare skin at base slate-blue; feet and legs blackish. Tarsi scutellated anteriorly transversely, covered behind with hexagonal scales.

Total length 25 inches; wing 12, tail $4\frac{3}{4}$, bill along culmen 6, tarsus $4\frac{1}{4}$.

20. Falcinellus guarauna.

?? *Scolopax guarauna*, Linn. Syst. Nat. (1766) p. 242.

Ibis chalcoptera, Temm. Pl. Col. no. 511 (1830); Wagl. Syst. Av. (1827) sp. 9; Vieill.

?? *Ibis mexicana*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 9; id. Ency. Méth. (1823) p. 1144.

? *Ibis guarana*, Wagl. Syst. Av. (1827) sp. 8 (?); id. Isis (1829), p. 759. sp. 1 (?); Cass. Wilkes, U.S. Exp. Exped. (1858) p. 302; Cabot, Proc. Bost. Soc. Nat. Hist. (1850) vol. 3, p. 313 (in part).

? *Tantalides guarana*, Wagl. Isis (1832) p. 1231.

Eudocimus guarana, Bon. Consp. Gen. Av. (1857) vol. ii. p. 159.

?? *Ibis brevirostris*, Peale, Zool. Exped. Birds (1848) p. 219, 1st ed., juv.

Hab. Columbia river to Chili and Buenos Ayres.

The *Scolopax guarauna* of Linnæus was founded upon the *Guarauna* of Margrave, a name given to a young bird said to have come from Brazil. Although it is impossible to decide with certainty what this bird really was, it is possible that it was the young of the present species, as it is not known that any other species of *Falcinellus* is found in Brazil. It will be best, however, even if a second species of this genus should be ascertained to inhabit Brazil, to retain the name of *guarauna* for the present bird, as otherwise a new name altogether would probably have to be given to it, since the only one which has certainly been applied to it, the *chalcoptera* of Temminck, had already been given previously by Vieillot to an African Ibis. The species has a wide distribution, ranging, according to Ridgway, from Chili and Buenos Ayres to the Columbia river.

A white band, enclosing the eye, passes around the entire base of bill. Head, neck, and underparts purplish chestnut. Back with metallic purple and violet reflections. Wings and tail bright green, varying with bronze and purple in certain lights. Shoulders reddish chestnut. Under tail-coverts have also metallic green and violet reflections. Bill apparently dark red.

21. FALCINELLUS RIDGWAYI.

Falcinellus ridgwayi, Allen, Bull. Mus. Comp. Zool. Cambr. iii. p. 355 (1876).

Ibis falcinellus, Scl. et Salv. P. Z. S. 1869, p. 156.

Hab. Lake Titicaca. Peru.

This form, thus far only known from Peru, is closely allied to the previous one, *F. guarauna*, but seems not to have the white front on the head. Several specimens are in Messrs. Salvin and Godman's collection, sent by Mr. Whitely from Peru. It is probable that the species has been confounded with the *F. guarauna*; for it seems hardly probable that it should be restricted to Peru, as all its relatives wander over such vast extent of country. It is not unlikely that its range will be found to be much greater than is at present supposed.

Head and neck dark chestnut-red, or purplish chestnut. Back dark green, with metallic purple reflexions. Wings metallic grass-green, with bronze and bright purple reflexions. Primaries bright grass-green. Entire underparts dark purple, the under tail-coverts

with green reflexions at their tips. Tail bright metallic grass-green, with rich purple reflexions. Thighs reddish. Bill apparently dark red. Feet and legs black. Total length without bill 17 inches; wing 11, tail 5, bill along culmen $3\frac{1}{2}$, tarsus $2\frac{1}{2}$.

22. FALCINELLUS THALASSINUS.

Ibis thalassina, Ridgway, Am. Nat. (1874) p. 110; Allen, Bull. Mus. Comp. Zool. Camb. (1876) p. 356.

Ibis guarauna, Baird, B. N. Amer. Atl. pl. 87.

Hab. Pacific coast of America from California to Chili (*Ridgway*); Straits of Magellan (*King*).

This seems to be among the very smallest members of this group of birds; it certainly is of the genus to which it belongs. It is readily recognized by the vivid green of the upper parts, and the brown head and neck, these last parts giving the bird the appearance of not being adult. A specimen in Messrs. Salvin and Godman's collection was brought from the Straits of Magellan by Capt. King, thus extending the range beyond that given by Mr. Ridgway, viz. quite to the end of the South-American continent.

Head and neck and underparts dark rufous brown, with some slight greenish reflections upon the flanks. Wings and upper parts and tail brilliant grass-green. Throat and cheeks light-brown, streaked with five white marks. Bare skin between the eye and bill, partly surrounding the former, apparently red. Bill reddish orange. Legs and feet dark red. Total length without bill $13\frac{1}{2}$ inches; wing 9, tail $4\frac{1}{4}$, bill along culmen $3\frac{1}{4}$, tarsus 3.

23. LAMPRIBIS OLIVACEA. (Plate LI.)

Ibis olivacea, Du Bus, Bullet. Acad. Brux. (1837) p. 105; id. Esquiss. Ornith. pl. 3; Reichenb. J. f. O. (1874) p. 378.

Hagedashia olivacea, Bon. Consp. Gen. Av. (1857) vol. ii. p. 153. sp. 2.

Comatibis olivaceus, Hartl. Syst. Orn. West-Afr. (1857) p. 231. sp. 657.

Geronticus olivaceus, Dohrn, Proc. Zool. Soc. (1866) p. 330. sp. 27.

Native name "Puwahor Aprawariu."

Hab. Guinea (*Hartl.*); Prince's Island (*Dohrn*); Denkera (*Ussher*).

This species is extremely rare; and I know of only three or four specimens, the majority of the museums in Europe not having it represented in their collections. It is very distinct from all other known species, and, like many of its relatives, belongs apparently to a genus different from any yet instituted, and is placed best between the *Falcinellus* and *Eudocimus*. I propose for it the term *Lampribis*, with the following characters:—

Space around and behind the eye, extending backwards to a point, and entire base of mandibles bare of feathers; the feathers of the throat reaching between the crura of mandible. Culmen on its basal

third extremely compressed laterally and forming a distinct elevated ridge above the maxilla. Nostrils set in a membrane at the base of culmen. Secondaries as long as the primaries, extending three fourths the length of the tail. Middle toe and tarsus of equal length; outer toe longer than inner.

Skin around base of bill, extending backwards and including the eye, denuded of feathers, in the skin jet black. Feathers on top of head dark green, in some lights with a coppery tinge. From the occiput springs a long loose crest, dark metallic grass-green, central part of some of the feathers dark buff. Upper parts bright shining olive-green, coppery in some lights. Neck and entire underparts rich dark buff, every feather edged with dark olive-brown. Wings bright metallic shining grass-green. Primaries and secondaries Prussian blue. Under tail-coverts dark grass-green. Bill bright red. Feet and legs red.

Total length without bill 16½ inches; wings 10½, tail 6, bill along culmen 4¾, tarsus 2.

Young similar to the adult, but wants the brilliant colouring of the wing, which is a dark green with Prussian-blue primaries and secondaries; and the underparts are dark olive-brown, with an occasional deep buff centre among the feathers.

The specimens described are in the collection of my friend Capt. Shelley.

24. Eudocimus albus.

Tantalus albus, Linn. Syst. Nat. (1766) p. 242. sp. 6; Gmel. Syst. Nat. (1788) p. 651. sp. 6; Lath. Ind. Orn. (1790) vol. ii. p. 705. sp. 9; Wils. Am. Orn. (1814) vol. viii. pl. 66; Bon. Wils. Am. Orn. (1832) vol. iii. p. 64, pl. lxvi. fig. 3.

Courly blanc d'Amérique, Buff. Pl. Enl. no. 915.

Scolopax alba, Bodd. Tab. Pl. Enl. Daubent. (1783) p. 55.

White Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 3. sp. 9.

Tantalus albus, var. *b*, Lath. Ind. Orn. (1790) vol. ii. p. 705.

Tantalus coco, Jacquin, Beyt. Gesch. Vög. (1784) p. 13. sp. x.; Gmel. Syst. Nat. (1788) vol. i. p. 652. sp. 15.

Ibis alba, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 16; id. Ency. Méth. tom. iii. p. 1145 (1823); Wagl. Syst. Av. (1827) sp. 5; Less. Trait. Ornith. (1831) p. 567, sp. 5; Wagl. Isis (1832) p. 1231; Nuttall, Orn. U. S. (1834) vol. ii. p. 86; Bon. Comp. List (1838) p. 49. sp. 317; Aud. B. Amer. 8vo ed. (1842) vol. vi. p. 54, pl. 360; id. Orn. Biog. vol. vii. p. 173, vol. v. p. 593; G. R. Gray, Gen. Birds (1847) vol. iii. p. 565. sp. 2; Baird, B. N. Amer. (1860) p. 684; Schleg. Mus. P.-Bas (1863) livr. 4, p. 5; Gray, Hand-l. Birds (1871) pt. iii. p. 38; Gundl. J. f. O. (1871) p. 272; Sclat. & Salv. Nomencl. Av. Neot. (1873) p. 126.

Ibis coco, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 19; id. Ency. Méth. (1823) tom. iii. p. 1148.

Ibis longirostris, Wagl, Isis (1829) p. 760; G. R. Gray, Gen. Birds (1847) vol. iii. p. 565. sp. 3, pl. 152; id. Hand-l. Birds (1871) pt. iii. p. 39.

Eudocimus alba, Wagl. Isis (1832) p. 1232.
Eudocimus longirostris, Wagl. Isis (1832) p. 1234.
Leucibis alba, Reich. Nov. Syn. Av. pl. 141. fig. 526 (1851).
Hab. Southern North America; Central America; Cuba.

The white Ibis is found in Florida in great flocks; and in the places selected by these birds to breed, many thousands are sometimes congregated together. The nest, which is flat and composed of sticks, is placed upon the fork of some branch; and as many as forty-seven, according to Audubon, have been seen on one tree. The young fly in four or five weeks; and as soon as they are able to take care of themselves the old birds leave them. They feed on shell-fish, slugs, snails, &c. When flying the species presents a beautiful appearance, each member of the flock imitating exactly the movements of the leader, as he proceeds with alternate flappings and sailings. At times they mount upwards to a great height and perform various and graceful evolutions, showing to great advantage with the sun shining upon their pure white plumage relieved only by the jet-black tips of the primaries.

Tips of primaries for about two inches black with bluish reflections, entire rest of plumage pure white. Anterior half of head bare, feathers reaching to about the middle of the eye, throat bare; the skin of these portions light red. Bill red, apical portion black. Tarsi have the anterior half transversely scutellated, hind part covered with hexagonal scales, and, with the feet, are red.

Total length 29 inches; wing 11, tail $4\frac{1}{2}$, bill along culmen $6\frac{1}{3}$, tarsus $3\frac{1}{2}$. Young:—Head and neck light brown, the feathers edged with white. Wings, back and tail chocolate-brown. Entire underparts and rump white. Bill entirely red; feet and legs flesh-colour.

25. EUDOCIMUS RUBER.

Tantalus ruber, Linn. Syst. Nat. (1766) p. 241. sp. 5; Gmel. Syst. Nat. (1788) vol. i. p. 651. sp. 5; Lath. Ind. Orn. (1790) vol. ii. p. 703. sp. 2; Wils. Am. Ornith. (1814) vol. viii. pl. 66; Cuv. Règn. Anim. (1829) p. 520; Less. Trait. Ornith. (1831) p. 567. sp. 3; Bon. Wils. Am. Orn. (1832) vol. iii. p. 63, pl. lxvi. fig. 2.

Tantalus minutus, Linn. Syst. Nat. (1766) p. 241. sp. 3; Gmel. Syst. Nat. (1788) p. 650. sp. 3; Lath. Ind. Orn. (1790) vol. ii. p. 708. sp. 19; Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23; id. Ency. Méth. (1823) tom. iii. p. 1151.

Tantalus fuscus, Linn. Syst. Nat. (1766) p. 242. sp. 7, juv.; Gmel. Syst. Av. (1788) p. 651. sp. 7, juv.; Lath. Ind. Orn. (1790) p. 705. sp. 8.

Courly rouge de Brésil, Buff. Pl. Enl. no. 80, juv., 81, ad.
Brown Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 110. sp. 8.
Lesser Ibis, Lath. Gen. Syn. (1783) vol. iii. p. 117. sp. 18.

Ibis rubra, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 22; id. Ency. Méth. (1823) tom. iii. p. 1150; Wagl. Syst. Av. (1827) sp. 4; Nutt. Orn. U. S. (1834) vol. ii. p. 84; Aud. B. Amer. 8vo ed. (1842) vol. vi. pl. 359, p. 53; id. Orn. Biog. vol. v. p. 62; G. R.

Gray, Gen. Birds (1847) vol. iii. p. 565. sp. 1; Baird, B. N. Am. (1860) p. 683; Schleg. Mus. Pays-Bas (1863) livr. 4, p. 6; Taylor, Ibis (1864) p. 95; Coues, Ibis (1865) p. 159; Dresser, Ibis (1866) p. 32; Léot. Ois. Trinid. (1866) p. 440; Gray, Hand-l. B. (1871) pt. iii. p. 38; Gundl. J. f. O. (1871) p. 275; Sclat. & Salv. Nomencl. Av. Neotr. (1873) p. 126; Garrod, Proc. Zool. Soc. (1873) pp. 467, 638 (1875), p. 342; Gulliv. Proc. Zool. Soc. (1875) p. 488.

Ibis minuta, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23.

Ibis fusca, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 17; id. Ency. Méth. (1823) tom. iii. p. 1146.

Ibis leucopygia, Spix, Av. Bras. t. 88, juv.

Eudocimus ruber, Wagler, Isis (1832) p. 1232; Gundl. J. f. O. (1856) vol. iv. p. 348.

Guara ruber, Reich. Nov. Syn. Av. pl. 139. figs. 525–27 (1851).

Hab. Cuba (*Gundlach*); North-eastern coast of South America to the mouths of the Amazon; Florida (*Aud.*), accidental.

If this species has been met with on the continent of North America, it is probable that it has only accidentally strayed there from its usual haunts, as it is properly an inhabitant of North-eastern South America, its appearance even in the West Indies, we may suppose, being uncertain and made at irregular intervals. As the genus *Ibis* was formed by Savigny for the *I. æthiopica* (Lath.), or Sacred Ibis, it cannot be retained for this bird and its allies, as has been generally done; and as *Eudocimus* of Wagler comes next, that must be the term employed. As there is no rule by which Moehring's genera can be received, and so many of them are rejected even by those who cite his works, it is not allowable that his term *Ibis*, instituted for this species, should take precedence of that of Savigny.

Entire plumage bright red, with the tips of the primaries jet-black for about two inches. Forehead, face, and throat bare, feathers coming forward anterior to the eye on top of head; bare space of throat and face red. Bill red, tip blackish. Legs and feet red.

Total length 25 inches; wing 10, tail $4\frac{1}{2}$, bill along culmen $4\frac{1}{3}$.

7. Descriptions of new Species of Phytophagous Coleoptera. By Martin Jacoby.

[Received May 23, 1877.]

Genus Aulacoscelis, Chevrol.

1. Aulacoscelis melanocephalus, sp. nov.

Elongate, subovate, widened behind; head and thorax shining black; epistome separated from the face by a deep transverse groove; antennæ entirely black, similar in length and shape to *A. melanocera*, Stål. Head smooth, shining, with a few scattered punctures. Thorax about half as long as broad, subquadrate; sides rounded from apex to about two thirds of their length, from there

to the base slightly sinuate, with the posterior angles depressed and acute; a transverse depression, bounded on each side by a short longitudinal ridge, is situated near the base. Surface moderately convex, entirely impunctate; scutellum broad, semiovate, smooth. Elytra broader at the base than the thorax, slightly widened behind, apex rounded; a short longitudinal depression is placed near the base of the shoulders. The entire surface of a light brick-red colour without gloss, finely and closely punctate; underside and legs black.

Length 3½ lines.

Hab. Guatemala.

Collected by Mr. O. Salvin.

Genus Megascelis, Latreille.

2. Megascelis purpureicollis, sp. nov.

Elongate, rather robust. Head shining coppery red, closely punctate, covered at its lower half with rather long golden pubescence, and traversed through its entire length by a distinct median groove; eyes emarginate; epistome greenish black; sides metallic, separated from the front by several strongly raised tubercles; antennæ with the first three joints testaceous, the rest fuscous. Thorax cylindrical, constricted distinctly behind the middle, of the same colour as the head, very finely punctate and rugose, covered almost entirely by yellow golden hair. Scutellum subquadrate, clothed with greenish golden pubescence. Elytra parallel, dark purplish, with about ten rows of elevated longitudinal ridges, the interspaces of which are distinctly transversely wrinkled, covered entirely with short golden pubescence, more strongly marked along the suture and the lateral margins, and plainly visible to the naked eye. Body below fuscous, with a metallic hue and silvery pubescence; legs flavous, tarsi almost black.

Length 3 lines.

Hab. Chontales, Nicaragua.

Collected by Mr. Janson.

Clythrinæ.

Genus Dachrys, Lacordaire.

3. Dachrys bipartita, sp. nov.

Oblong, widened behind; head distinctly and somewhat coarsely punctate, especially near the inner border of the eyes, black, shining; antennæ with the four basal joints fulvous, the rest black, the latter colour also occupying partly the first joint in some specimens; in length they do not reach to the base of the thorax, and have the first joint very swollen and almost globular, the second extremely short, the third nearly three times the length of the second and thickened at its apex, the fourth a little longer than the second, and the rest transverse, subquadrate. Thorax transverse, with the anterior margin not advanced in front, and the posterior slightly lobed in the middle, the sides very slightly, the posterior angles strongly rounded, the anterior ones distinct; surface shining black, every-

where evenly and finely punctate; scutellum broadly triangular, with a few fine punctures at each side, black. Elytra about twice and a half as long as the thorax, distinctly widened towards the middle and rounded at the apex, regularly punctate-striate, the punctures only disappearing at the extreme apex, the interstices smooth and shining; their whole basal half is occupied by an almost square patch of bright fulvous, while the posterior part is shining black, and has at its apex another rounded spot of fulvous. Legs black, covered, as well as the entire underside, with fine silky whitish hairs.

Length 2 lines.

Hab. Chontales, Nicaragua.

Collected by Mr. M. Janson.

This species will be easily distinguished from *D. scutellaris* by the strong punctation of its head, the colour of the antennæ, and the design of its elytra.

Eumolpidæ.

Genus Metaxyonycha, Chevrol.

4. Metaxyonycha tridentata, nov. sp.

Subcylindrical, semiconvex, testaceous. Head with a distinct fovea in the middle and an oblique depression below each eye, both of which are deeply but sparingly punctate, lower part of face sparingly punctate, testaceous, apex of mandibulæ black; antennæ nearly as long as the body, joints 5, 6, 7, and the last fuscous, the rest flavous. Thorax very convex on the disk, anterior and posterior margins parallel, the angles tuberculate; the lateral margins very widened in the middle, and at that place very distinctly three-dentate. A profound impression is placed on the surface on each side near the middle; and the entire disk is irregularly and coarsely punctured. Scutellum smooth. Elytra much wider than the thorax, the sides parallel, with about ten longitudinal more or less distinct costæ, which for the most part unite at their extremities, the intervals of which are coarsely and deeply punctate; each elytron with two transverse spots of a shining metallic light green, the first situated on the shoulder, of a nearly square shape, and extending halfway across the elytra, the second below the middle, of a narrow band-like shape, a little curved, and not touching the sutural margin. Underside light testaceous as well as the legs. Tarsi a little darker.

Length 4 lines.

Hab. Chontales, Nicaragua.

Collected by Mr. Janson.

Genus Rhyparida, Baly.

5. Rhyparida madagascariensis, sp. nov.

Oblong-ovate, entirely rufous, smooth, shining; head with a more or less distinct longitudinal depression in the middle sparingly but distinctly punctate; clypeus testaceous, distinctly separated from the face, the anterior edge emarginate and narrowly piceous, surface punctured the same as the head; labrum dark brown, mandibulæ

entirely piceous; four basal joints of the antennæ rufous, the rest black. Thorax about twice as broad as long, the sides regularly rounded, the anterior angles largely developed into a point and diverging outwardly, all the sides narrowly margined; surface very minutely granulose, remotely but distinctly punctured on the disk, the sides almost destitute of punctures; a faintly visible longitudinal and smooth line extends across the middle of the disk; scutellum slightly sinuate below the base at the sides, apex subacute, surface impunctate, minutely granulose. Elytra much wider than the thorax, scarcely narrowed behind, the apex regularly rounded, and the sides with a narrow but deep margin, each elytron with about six distinct striæ of small punctures, the sides confusedly punctate; the first stria, near the scutellum, is very short, the space between the second and third and the fourth and fifth is wider than between the rest of the striæ; the interstices also very minutely punctured and granulose. Underside testaceous, prosternum coarsely punctate near the sides, smooth in the middle; legs rufous, apex of tibiæ and the entire tarsi black. The posterior thighs with a small sharp tooth.

Length 4 lines.

Hab. Madagascar.

Collection Jacoby.

6. RHYPARIDA COSTATIPENNIS, sp. nov.

Oblong, semiquadrate, piceous. Head piceous, rugose-punctate, epistome not separated, with the apex and the labrum of a fulvous colour; antennæ entirely flavous. Thorax with the anterior margin sinuate at the sides, the posterior margin rounded, and the lateral ones almost parallel at the apex, slightly widened behind the middle, all the angles obtuse and not produced into a distinct tooth; surface closely and coarsely punctuate, piceous. Scutellum smooth, broader than long. Elytra slightly wider at the base than the thorax, parallel with the apex, regularly rounded. Each elytron with thirteen rows of deeply impressed punctures, not diminishing in size towards the apex, with the interspaces costate, the costæ more raised towards the apex than near the base, and more or less minutely punctured; all the costæ unite at the apex in such a way that the first costa near the sutural margin forms a sharp angle with the last costa, and the intermediate ones in the same way with the corresponding costæ. The colour is a dark piceous, with a faint reflection of cupreous, the extreme lateral margin having a greenish reflection. Underside dark brown or piceous as well as the legs, with the tarsi testaceous. All the thighs armed below with an acute tooth.

Length $2\frac{3}{4}$ lines.

Hab. Madagascar.

In my collection.

7. RHYPARIDA NIGRICOLLIS, sp. nov.

Oblong, ovate, shining, elytra rufous, thorax, head, and feet black. Head obsoletely punctured on the vertex, with a longitudinal middle line, at the end of which is a shallow round fovea; epistome sepa-

rated from the head by a rather indistinct transverse groove, punctured a little more distinctly than the head; labrum fulvous, as well as the first two joints of the antennæ, the rest black. Thorax regularly convex, the sides much deflexed anteriorly, all the angles acute, and produced into a short tooth; surface almost smooth, a shallow transverse depression extends across the disk a little behind the middle, and is strongly punctured near the sides. Scutellum nearly as broad as long, smooth, rufous. Elytra wider than the thorax, rufous, shining, distinctly punctate-striate, the striæ strongly impressed near the base and diminishing towards the apex. The first stria is very short and the second curved obliquely upwards towards the base; below the basilar space is a shallow indistinct fovea. The seventh and the following striæ commence on the hinder portion of the humeral callus, this latter being limited by the strongly impressed sixth stria up to the base of the elytra. Entire underside, with the exception of the abdomen, which is light-fulvous-coloured, black. Intermediate and posterior thighs with a distinct tooth.

Length 3 lines.

Hab. Madagascar.

In the collection of the British Museum and my own.

Genus Scelodonta, Westwood.

8. Scelodonta viridimaculata, sp. nov.

Subquadrate, semiconvex, brownish, opaque. Head with the vertex coarsely rugose, cupreous, lower face indistinctly transversely rugose, shining metallic green at the sides, palpi testaceous, antennæ black; thorax subcylindrical, the anterior and posterior margins much widened in the middle, closely covered with transverse raised strigæ of a brownish purplish colour, with a metallic-green narrow longitudinal stripe in the middle, and the sides to a greater extent ornamented with the same colour. Scutellum pentagonal, entirely green. Elytra much wider at base than the thorax, longitudinally costate throughout, the interspaces deeply punctured and partly reticulate, of the same brownish ground-colour as the thorax, with a transverse band commencing a little below the shoulder, where it is widest, and extending in an oblique direction to a short distance from the suture, of a shining metallic green, while another narrower stripe of the same colour is situated at a short distance from the apex, having an upward direction, and is connected with the apical part of the sutural and exterior margin by a narrow border of metallic green. Underside metallic green. Legs purplish, each thigh armed with a short tooth.

Length 3 lines.

Hab. Cameroons, Africa.

In my collection.

Genus Dermorrhytis, Baly.

9. Dermorrhytis cærulea, sp. nov.

Elongate, shining, above violet-blue; head slightly convex, with

a distinct, short, longitudinal middle groove, strongly punctate, longitudinally rugose near the eyes, violet-blue; epistome wedge-shaped, separated from the front, with the anterior margin emarginate, strongly punctured, and covered with short whitish pubescence; labrum, mandibulæ, and the last joints of the palpi black, the first two joints testaceous, antennæ with the seventh joint the longest, the first much thickened and nearly globular, the second less than half the length of the third, the last joints elongate and almost cylindrical; the first five joints are of a greenish black colour and shining, while the rest is very light flavous and strongly covered with whitish hair; thorax with the sides obliquely deflexed in front and converging from the base to the apex, with the anterior angles produced into a short tooth, and the extreme lateral margins slightly waved, posterior margin transversely grooved through its entire length, above subcylindrical, covered with crowded large punctures near the base, more finely near the apex, shining greenish violet; scutellum with the apex broadly rounded, scarcely longer than broad, impunctate; elytra broader than the thorax, parallel, slightly narrower towards their apex, extremely closely and transversely rugose, strongly punctured near the base, and longitudinally costate near the extreme apex and the suture at its extremity, of a uniform violet-blue, with a greenish reflection; underside obscure metallic blue finely punctate; legs of the same colour, tarsi light brownish, covered with yellowish pubescence.

Length 4 lines.

Hab. Borneo.

Collection Jacoby.

Chrysomelidæ.

Genus Doryphora, Illig.

10. Doryphora bicolor, sp. nov.

Ovate, convex, piceous above, shining; head black, opaque, very remotely and finely punctate, labrum fulvous; antennæ black, with the first two joints beneath testaceous; thorax black, moderately convex, the lateral margins parallel at the base till about the middle, from there moderately rounded to the apex, the anterior angles not much produced, surface distinctly and not closely punctate, the punctuation much stronger than the head, but not stronger near the sides than on the disk; scutellum triangular, impunctate. Elytra a little wider at the base than the thorax, regularly rounded towards the apex, punctate-striate, the striæ arranged in double rows, which are now and then, especially towards the sides, a little irregular, of a dark piceous colour; a narrow flavous band extends from across the base of each elytron along the lateral margins (leaving, however, a small border of the ground-colour) to the apex, and, after running upwards close to the suture to the middle of the elytra, is connected by another transverse band of the same size and colour with the lateral one. Body beneath and legs shining black, the mesosternal process rather long and slightly curved.

Length 5 lines.

Hab. Chontales, Nicaragua.

Collected by Mr. M. Janson.

This species resembles much in pattern *D. sheppardi*, Baly; but it is easily distinguished from that species by its small size and the double rows of punctures on the elytra, the punctuation in *D. sheppardi* being more irregular, and so coarse as to be distinctly visible to the naked eye.

11. Doryphora ornata, sp. nov.

Ovate, convex, shining; head black, covered with fine and remote punctures, labrum fulvous; mandibulæ, palpi, and antennæ black; thorax very shining black, with a slight greenish tint, evenly and distinctly but not closely punctate, with two or three rather deep impressions near the lateral margins; scutellum entirely impunctate; elytra strongly punctate-striate, the striæ running together in pairs, more obsolete towards the apex, shining black, each elytron with four spots of a bright fulvous colour, situated as follows—one oval-shaped near the scutellum, another near the sutural line, exactly in the middle, a larger pear-shaped spot reaching from the base of the shoulder to a little before the middle, and a large triangular patch occupying the entire apex and terminating in a sharp point; this patch contains a small roundish black spot near its extremity; body below, feet, and tarsi black, shining.

Length 5 lines.

Hab. Chontales, Nicaragua.

Collected by Mr. Janson.

12. Doryphora antennalis, sp. nov.

Ovate, convex; head and thorax dark brown, elytra flavous, with brown, irregular, longitudinal patches. Head with a few fine irregularly distributed punctures; antennæ almost filiform, with the third joint nearly double the length of the fourth and the longest, the following joints slightly stouter, and the last very nearly as long as the third, and very pointed at the apex, the first five joints brown, the rest fuscous, with the exception of the last, which is of a light testaceous colour, labrum and palpi brown, thorax with the lateral margins parallel until about the middle, from there slightly widened and much rounded towards the apex, the anterior angles acute, surface deeply but not closely punctate, with a distinct longitudinal depression at a little distance from the lateral margin; scutellum triangular, smooth, brown, margined with black; elytra wider at the base than the thorax, oblong-ovate, regularly rounded near the apex, distinctly striate-punctate till about the middle, very obsoletely from there to the apex flavous, lateral margin, the suture, an oblong patch, much widened in the middle, running in an oblique direction from the base near the scutellum towards the sutural margin behind the middle, and another longitudinal subquadrate patch near the apex, not touching the suture nor the exterior margin, dark brown; in the middle of the elytra another short streak of the same colour is

attached to the sutural stripe, causing the latter to assume a widened appearance. Body below and legs lighter or darker brown, metasternal process proportionately long, stout, and curved near the apex.

Var. Thorax, head, and markings on the elytra dark fuscous or black.

Length 4½ lines.

Hab. Chontales, Nicaragua.

Collected by Mr. Janson.

It is doubtful if this species ought to be retained in the genus *Doryphora*, as the filiform antennæ distinguish it from the other species of this genus, and show rather its affinity to the genus *Prosicela* of Chevrolat, from which it is, again, distinguished by the strong development of the metasternal process.

13. DORYPHORA SEXMACULATA, sp. nov.

Oblong, ovate; head and thorax greenish or brown, elytra greenish black, each elytron with three large fulvous spots. Head closely and finely punctate, with a smooth longitudinal middle line; labrum and palpi pitchy; antennæ rather long, gradually increasing in width towards the apex, greenish black or brown; thorax but little convex in the middle, with the anterior margin slightly sinuate, the anterior and posterior angles very acute, and the surface closely and evenly punctate, the punctuation a little stronger than that of the head; scutellum triangular, impunctate, shining; elytra a little wider at the base than the thorax, strongly punctate-striate, the striæ more regular near the sutural line than near the sides, greenish black, an irregular oblong spot at the base near the scutellum, a triangular-shaped one, of larger size, in the middle, near the lateral margin, and another, of the same size or larger, near the apex of each elytron fulvous; body below and legs greenish.

Length 6 lines.

Hab. Peru.

Collection Jacoby.

This species varies, as the description shows, in colour, from greenish to brown as regards the head, antennæ, and thorax, as well as the entire underside, with the legs, but does not differ in other respects.

14. DORYPHORA CHRYSOMELOIDES, sp. nov.

Ovate, very convex, and much widened behind, very shining, of a uniform greenish bronze-colour; head with a more or less distinct middle line on the vertex, very irregular, and rather strongly punctate, with a triangular flavous spot near the base; epistome separated from the front by a more or less rounded thin groove, punctured; labrum and mandibulæ greenish black; antennæ not half the length of the body, the first joints metallic green, the rest violaceous black and transversely subquadrate. Thorax with the anterior margin slightly produced in the middle, and a shallow, more or less distinct fovea near the lateral margins; disk finely punctate, the punctures

much stronger near the sides, entirely shining green, with a bronze reflection; scutellum impunctate. Elytra very widened from behind the middle, everywhere irregularly and very finely covered with punctures, the interstices having a scratched appearance, shining green, with a coppery reflection. Body below of the same colour; metasternal process conical, slightly curved.

Length 5½–6 lines.

Hab. Peru.

Two specimens in my collection.

This species seems nearly to agree with Stål's description of his *D. nitidissima*, but differs in the irregular and fine punctuation of the elytra, and the smaller size as well as the colour of the antennæ.

15. Doryphora bisbimaculata, sp. nov.

Ovate, moderately convex; head greenish, distinctly punctured, labrum dark fulvous, mandibulæ black; first four joints of the antennæ testaceous, more or less stained with fuscous, the rest black, and gradually increasing in width. Thorax with the middle of the anterior margin straight, the posterior one rounded, and the sides almost crescent-shape, and deeply depressed before the lateral margins; surface on the disk finely and not closely, sides strongly and deeply punctate; the entire disk is occupied by a flavous patch, leaving a narrow anterior and posterior margin, as well as the sides to a greater extent, greenish black. Elytra scarcely wider at the base than the thorax, parallel towards the middle, and slightly widened behind, the surface irregularly punctate-striate, the striæ sometimes running in double rows, but near the sides the punctuation is altogether irregular and confused; the colour consists of the same greenish tint as the head, slightly shining; and each elytron is marked with two large spots of a fulvous colour, of which one, of a semiquadrate form, is situated a little before the middle, without reaching either the lateral or the sutural margin; another spot, of a more triangular shape, is placed closer to the suture, near the apex, being accompanied in some specimens by two more minute spots near the lateral margin. Entire underside and legs black, shining.

Length 6 lines.

Hab. Chontales, Nicaragua.

Collected by Mr. Janson.

Genus Calligrapha, Chevr.

16. Calligrapha distinguenda, sp. nov.

Oblong-ovate. Head with a fine but distinct longitudinal middle line, epistome separated by a triangular groove from the front, strongly punctate, vertex very sparingly punctured, brown; labrum fulvous; mandibulæ fuscous. Antennæ with the first four joints fulvous, the rest black; they reach to a little more than the base of the thorax, and have the last five joints transversely subquadrate and the extremity acute. Thorax with the lateral margins almost parallel, a little wider at the base than at the apex, posterior margin

broadly rounded, and the anterior angles subrotundate; the disk contains some remote but strongly marked punctures, while the sides and the commencement of the posterior margin is strongly impressed with large punctures, distinctly visible to the naked eye; surface uniformly darkish brown. Scutellum elongate, triangular, smooth, black. Elytra scarcely wider at the base than the thorax, slightly widened behind the middle, surface rather convex; they are regularly striate-punctate on their inner half, while the outer portion contains numerous irregularly distributed punctures, not so deeply impressed as those near the suture, of a light testaceous colour, the suture and four spots on each elytron of a greenish black colour, and placed as follows:—two longitudinal streaks, a little widened at their extremities a little below the base, of equal size, one of which is situated near the scutellum, the other near the exterior margin; a transverse vitta a little behind the middle, not touching the lateral nor the sutural margin, sinuate in middle, and forming at the sutural end a short angle parallel with the suture; and another short oblique spot near the apex: this spot is sometimes connected with the transverse vitta by a thin line. Body below shining cupreous, with a greenish tinge. Abdominal segments each with a shallow fovea near the sides.

Var. a. The spots on the elytra not much darker than the ground-colour, and indistinct (immature?).

Length 4½ lines.

Hab. Chontales, Nicaragua.

Collected by Mr. Janson.

Although this beetle is, in the punctuation and markings of the elytra, quite different from other species belonging to this genus, its structural characters agree in every particular.

17. CALLIGRAPHA ELEGANTULA, sp. nov.

Oblong, moderately convex; head shining, greenish black, with a longitudinal middle line, strongly punctate as well as the epistome; labrum fulvous at the base; antennæ with the first six joints metallic violet-blue above, testaceous below, the rest black, and longer than broad. Thorax of the same colour as the head, the anterior margin slightly widened in the middle, the posterior one broadly rounded, each side with a distinct rounded fovea, variolose punctate; disk remotely and finely punctured. Scutellum greenish, smooth. Elytra broader at the base than the thorax, straw-coloured, with the following shining greenish black markings:—a common sutural vitta, commencing a little below the base, slightly narrowed in the middle, and extending to the apex; a longitudinal narrow stripe, club-shaped at its extremity, accompanies the sutural vitta without touching it from the first third of each elytron to a little behind the middle, and having a roundish spot above it near its base; an oblique large spot on the shoulder, pointed at its apex; three transverse spots, of which the first is the smallest, the others of irregular shape below the humeral one, all at equal distance from the lateral margin, which remains of the ground-colour; three small round

spots placed triangularly near the apex, and sometimes connected with each other, and another round spot in the middle, near the subsutural stripe. Entire underside and legs shining greenish black. The abdominal segments punctate and thinly pubescent at their base.

Length 4 lines.

Hab. Costa Rica.

Collection Jacoby.

Galleruciдæ.

Genus Monocesta, Clark.

18. Monocesta dimidiata, sp. nov.

Subelongate, ovate, much dilated posteriorly, anterior half reddish brown, posterior black; head sparingly and obsoletely striate, with a distinct longitudinal impressed line through its entire length, and a deep transverse groove between the eyes, brown, shining; antennæ nearly half the length of the body, black, with the exception of the first joint, which is reddish fulvous; thorax transverse, a little narrowed in the middle, broadly emarginate near the anterior angles, with a deep oblique depression on each side towards the middle, shining reddish brown, closely but very obsoletely punctured, the disk nearly smooth; scutellum finely punctuate, very rounded at the apex. Elytra greatly dilated almost from the base to behind their middle, impressed below the shoulder near the lateral margin, and narrowly margined, apex simple, extremely close and finely punctured throughout, reddish brown at their anterior half, black from there to the apex. Anterior part of the underside fulvous, part of breast, entire abdominal segments and legs (with the exception of the first two pairs of the anterior thighs, which are fulvous) black.

Length 7 lines.

Hab. Peru.

In my collection.

19. Monocesta nicaraguensis, sp. nov.

Broadly ovate, rufo-fulvous, pubescent. Head and vertex impressed with a longitudinal groove, minutely punctate and sparingly pubescent, labrum and mandibulæ darker; antennæ black. Thorax much narrowed in the middle, the apex slightly wider than the base and rounded; surface irregularly and transversely impressed, sparingly pubescent. Elytra broadly margined, much dilated posteriorly, the punctuation scarcely visible, and covered everywhere with rather long reddish brown hair. Body below, together with the tibiæ, fuscous, anterior pair of thighs fulvous.

Length 5 lines.

Hab. Chontales, Nicaragua.

Collected by Mr. Janson.

Among the posteriorly dilated species of this genus, the present one will be recognized by the uniform coloration of the entire upper surface, the rather long pubescence, and the colour of the antennæ, all of which are exactly the same in all the specimens before me.



J.Smit lith.

Hanhart imp.

1. EUPHONIA INSIGNIS.
2. CHLOROSPINGUS PHÆOCEPHALUS.

8. Descriptions of six new Species of South-American Birds.

By P. L. Sclater, M.A., Ph.D., F.R.S., and Osbert Salvin, M.A., F.R.S.

[Received June 4, 1877.]

(Plate LII.)

We have again to offer to the Society descriptions of six apparently new species of birds from collections made in Ecuador and Peru, that have lately reached us.

1. Basileuterus castaneiceps, sp. nov.

Brunnescenti-olivaceus pileo medio castaneo-rufo, utrinque lineâ nigrâ limbatâ : loris et capitis lateribus cinereis : subtus albus, lateraliter in cinereum trahens, crisso et campteriis alarum flavescentibus : rostro corneo, pedibus pallide corylinis : long. tota 5·3, *alæ* 3·0, *caudæ* 2·5.

Hab. Jina[1] in rep. Æquatorianâ (*C. Buckley*.)

Mus. S.-G.

Obs. Species pileo ad *B. coronatum*, ventre albo ad *B. leucoblepharum* et hujus affines magis appropinquans.

This species must be placed in the section "B, *b*" of the genus as divided by Sclater (P. Z. S. 1865, p. 283), near *B. leucoblepharus* and *B. stragulatus*, although its head-colouring is that of *B. coronatus* (section B, *a*).

2. Euphonia insignis, sp. nov. (Plate LII. fig. 1.)

Supra purpurescenti-nigra, dorso postico flavo : pileo et cervice postica cæruleis : fronte aurantiacâ, lineâ nigrâ postice marginatâ : subtus aurantiaco-flava, gutture nigro ; subalaribus flavidis, remigum marginibus internis albis : rostro nigro, pedibus fuscis : long. tota 4·6, *alæ* 2·6, *caudæ* 1·6.

Hab. Jina, in rep. Æquatorianâ (*C. Buckley*).

Mus. S.-G.

Obs. Species *E. nigricolli* affinis, sed fronte aurantiacâ distinguenda.

Mr. Buckley has sent two skins of what we suppose to be males of this very distinct species.

3. Chlorospingus phæocephalus, sp. nov. (Plate LII. fig. 2.)

Oleagineo-viridis, pileo fuscescente : subtus dilutior et flavescentior, ventre medio ochrascenti-cinereo, crisso sicut latera flavicante ; gutture paulum fuscescente : subalaribus flavicanti-albis, remigum marginibus internis pallide cinereis : rostro corneo, pedibus corylinis : long. tota 5·3, *alæ* 3·0, *caudæ* 2·3.

Hab. In rep. Æquator. Jina (*C. Buckley*) ; Chillanes (*Fraser*).

Mus. S.-G. et P. L. S.

[1] Jina lies on the head-waters of Rio Santiago, not very far from Cuenca.

Obs. Species *Ch. flavipectori* forsan proxima, sed gutture fuscescente dignoscenda.

Of this *Chlorospingus* Mr. C. Buckley obtained a single skin at Jina, in Ecuador, during his recent excursion into that country. Sclater has long had a specimen of the same bird, which was collected by Fraser at Chillanes, in Ecuador, in 1858. The latter has hitherto been erroneously referred to *C. albitemporalis*, under the impression that it might be an immature bird. The species is of the general size and structure of *C. flavipectus*.

4. TODIROSTRUM RUFIGENE, sp. nov.

Supra læte olivaceum, pileo et capitis lateribus rufis : alis nigris, tectricum apicibus et secundariorum marginibus externis flavis, remigibus extus olivaceo stricte marginatis : caudâ fuscescenti-olivaceâ, rectricibus externis maculâ apicali flavicante præditis: subtus flavum, pectore sordide albicante, gutture rufescente, hypochondriis in olivaceum trahentibus : rostro nigro, pedibus pallide corylinis : long. tota 3·3, *alæ* 1·6, *caudæ rectr. ext.* 1·0, *med.* 1·25.

Hab. Mongi, in rep. Æquator. (*C. Buckley*).

Mus. S.-G.

Obs. Sp. *T. ruficipiti* affine, sed gutture et capitis lateribus rufescentibus diversa.

5. LATHRIA CRYPTOLOPHA, sp. nov.

Saturate olivacea fere unicolor : corpore subtus præcipue in ventre medio paulo flavescentiore : subalaribus flavissimis ; alis et caudâ fuscis extus olivaceis ; primariis internis et secundariis intus pallido fulvescenti marginatis : cristâ capitis obtectâ saturate castaneâ : rostro nigro : pedibus plumbeis : long. tota 9·0, *alæ* 5·6, *caudæ* 4·2, *rostri a rictu* 1·1, *tarsi* 1.

Hab. Mongi, rep. Æquat. orientalis.

Mus. S.-G.

Obs. L. subalari affinis, sed dorso postico, caudâ, et alis extus olivascentibus nec grisescentibus, cristâ quoque capitis castaneâ nec nigrâ distinguenda.

Mr. Buckley has sent a single skin of this fine species, which at one time we thought might possibly prove to be a male of *L. subalaris*; but on examining the type specimen of the latter in the British Museum, we find that it doubtless is a male, having a concealed *black* crest, and the hinder portion of the body and tail ashy, as given in Sclater's original description. In the present bird the crest is deep chestnut, and the lower portion of the body olive-green, like the back.

6. FULIGULA NATIONI, sp. nov.

Fusco-brunnea ; subtus paulo brunnescentior : corpore undique albido minutissime irrorato : capite summo et collo usque ad pectus nigricantibus, genis et gutture anteriore rufescentibus : angulo inter ramos mandibulæ (sicut in speciebus omnibus hujus



Fig. 1.

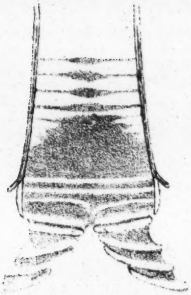


Fig. 2.

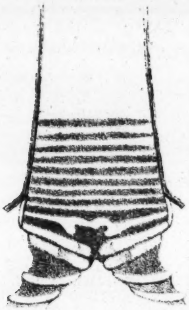


Fig. 3.



Fig. 4.

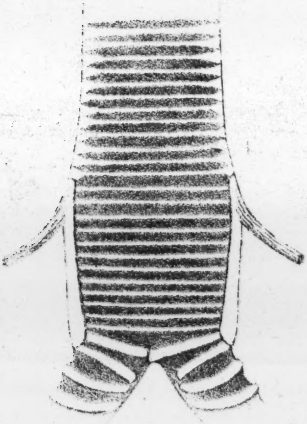


Fig. 5.

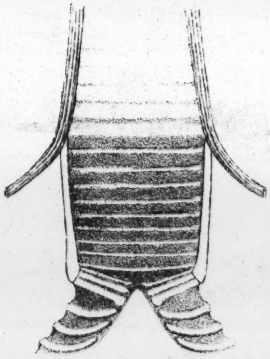


Fig. 6.



Fig. 7.



Fig. 8.



J. Smit lith.

M & N Hanhart imp.

ANATOMY OF PASSERINE BIRDS

generis) *albo : remigibus fusco-nigris, primariis internis media-liter albidis : speculo alari albo : rostro et pedibus brunnescentibus : long. tota* 17, *alæ* 7·8, *caudæ* 2·3, *rostri a rictu* 2, *tarsi* 1·4, *dig. med. cum ungue* 2·3.

Hab. Peruvia occidentalis, prope Lima (*Nation*).

Mus. S.-G.

Obs. F. collari forsan affinis, sed speculo alari albo nec griseo, genis et gutture rufescentibus facile distinguenda.

A specimen of this curious duck was received by Mr. Sclater from Prof. Nation by post[1], in January last. In a subsequent letter Prof. Nation says that it is found occasionally in the fresh-water lakes near Lima, in company with *Querquedula cyanoptera*, and *Dafila bahamensis*. The example sent is a female; and Prof. Nation believes the colouring of the plumage in both sexes to be alike. The irides are of a brownish red, the bill and tarsi brownish.

9. Notes on the Anatomy of Passerine Birds.—Part III. By A. H. Garrod, F.R.S., Prosector to the Society.

[Received June 1, 1877.]

(Plate LIII.)

On the present occasion I take the opportunity of describing the voice-organ in some species of the non-oscinine (mesomyodian) Passeres in which that structure is, so far as I am aware, unknown.

Leaving any deductions until I have recorded the nature of the structures, I will commence with an account of the syrinx in some of the Tracheophonæ.

Hylactes megapodius.—In this species the syrinx is not identical with any of those described by J. Müller[2]. It does not differ much from those of *Scytalopus indigoticus* and *Chamæza brevicauda* in its essential structure. By Müller, however, no mention is made of a peculiarity which I find in this species, which seems to me to throw some light upon the method of development of the tracheophone syrinx. This consists in the way in which the characteristic very slender rings of the specialized voice-organ, instead of ceasing abruptly at its upper end, continue upwards on the anterior surface of the trachea for a considerable distance, whilst posteriorly they suddenly change their breadth superiorly where the syrinx ceases. Figures 4 and 5 of Plate LIII represent the anterior and posterior views of the organ.

The *processus vocales*, which rest on the first and second modified and ossified bronchial semi-rings, extend up as far as the tracheal true ring, twelfth from the bottom. These twelve lowermost tracheal

[1] By the same conveyance Prof. Nation has also recently sent us the skins of *Rallus virginianus* (previously not known so far south, see P. Z. S. 1868, p. 445), *Lampropsar warcewiczii* (= *Quiscalus æquatorialis*, Scl.), *Rhodopis vesper*, *Myrtis fanny*, and *Thaumastura cora*, all from the vicinity of Lima.

[2] Abh. Akad. der Wissenschaften zu Berlin, 1847.

rings are incomplete opposite the *processus vocales* (in other words, at their sides), as they are in all the Tracheophonæ; and the lowest is also broken, as it were, in the middle line behind.

Posteriorly the lower nine are extremely slender; the tenth (counting upwards) is somewhat thicker, the eleventh still more evidently so, whilst the twelfth is as thick as any of the superior rings.

Anteriorly there are twenty-three of the lower tracheal rings, which are quite slender in the middle line, especially the lowest three; and of these the twelve lowest (those split laterally) are slender from one side to the other, whilst the upper eleven appear thick at their extreme ends on account of the intrusion, for a short distance round the sides of the tracheal tube, of the thickening above recorded of their hinder parts, which diminishes rapidly in a spindle-pointed manner.

The lowest tracheal ring is as slender as those just above it; and it is worthy of note that the *processus vocales* rest upon the thickened second bronchial semi-ring as well as on the first. These vocal processes cannot be detached from the sides of the trachea without injuring it; and the sterno-tracheal muscles arise from their apices, to which are also attached thin muscular sheets which extend up the windpipe laterally and a little posteriorly.

Grallaria guatemalensis.—In this species also the specialized syrinx does not cease abruptly at its upper end, the superior rings of the trachea, which help to constitute it, gradually losing their individual character. Figs. 1 and 2 (Plate LIII.) represent the front and back view of the organ, which is peculiarly shallow for its width, and involves but six of the lowermost tracheal rings. These six are incomplete at their sides where they are in contact with the *processus vocales*, which latter are small, flat, fusiform ossifications, pointed both at their upper and lower ends, and just touch the upper of the two superior enlarged and ossified bronchial semi-rings, the remainder of each bronchus being of the normal character. The lowermost tracheal is incomplete in the middle line in front, as well as at the sides, whilst behind it is thickened, and sends small downward processes on each side of the middle line in such a manner as to develop a notch between them. Figure 3 represents the left-side view of these structures, seen from the interior of the organ, *a* being the *processus vocalis*. From figure 1 it can be seen that the tracheal rings four, five, and six from the bottom are not ossified at all in front, and that rings seven, eight, and nine are only so at their sides, whilst ring ten, with those just above it, are extremely thin in the middle. Posteriorly also, from figure 2 it can be inferred that the rings above the bottom ones are very slender, becoming thicker by degrees above the sixth, which is the highest of those constituting the voice-organ.

With reference to the muscles, it may be stated that the lateral muscle of the trachea on each side covers and joins the upper extremity of the *processus vocalis*, turning off to become the *musculus sterno-trachealis* opposite the ring third from the end, and sending no continuation on to act directly upon the bronchial semi-rings.

Lipaugus cineraceus.—In this species the single specimen at my disposal, which Mr. Edward Bartlett has most kindly given me, has the lower part of the windpipe considerably damaged by shot. Nevertheless, as one side is comparatively uninjured, I have been able to make out the essential points in the structure of the syrinx, which does not differ much from that of *Pipra leucocilla*, as represented by Müller[1]. The lowermost rings of the trachea are not peculiar, each one being deep, and meeting, at its superior and inferior margins, the rings above and below it. The first and second bronchial semi-rings resemble those of the trachea in their flatness, depth, and approximation, the third being the first normal bronchial ring. It, with those which follow, are slightly peculiar in that they are ossified throughout, except in a small part, equal to about one sixth the breadth of each semi-ring, one third distant from their anterior ends, where they retain their primitive cartilaginous structure (*vide* Plate LIII. figs. 6 and 7).

The lateral muscle of the trachea is of considerable breadth, being most developed anteriorly, those of the opposite sides coming nearly into contact in the middle line in front. Opposite the tracheal ring seventh from the bottom, the small sterno-trachealis is differentiated off from the posterior portion of this muscle, by far its larger anterior part continuing downwards to become the intrinsic muscle of the syrinx, which ceases at its insertion into the anterior half of the third bronchial semi-ring. It exhibits no tendency to split into two as in *Pipra leucocilla*.

It may be mentioned that the second bronchial semi-ring is somewhat expanded at its ends, intruding more into the membranous completion of the bronchial tube than do those which follow it. The damaged condition of my specimen makes it impossible to determine whether the antero-posterior bar, which is situated at the point of bifurcation of the trachea, is formed by the last tracheal ring, or by the completion and junction of the first bronchial rings of either side. I am inclined to think it depends on the latter of these conditions.

Chiromachæris manacus, according to the description given by Müller, agrees exactly with this species, as far as its syrinx is concerned.

Heteropelma veræ-pacis.—It is Mr. Salvin whom I have to thank for a specimen of this species, as well as the next to be described, in spirit. Its voice-organ is most simple. The single, broad lateral muscle of each side of the trachea continues down to the middle of the second bronchial semi-ring, which is scarcely different from those below it either in bulk or appearance; and the one above it resembles it. There is, however, a considerable interval between it and the third, whilst it almost touches the first. None of the lowermost tracheal rings are peculiar in any way.

Hadrostomus aglaiæ is a bird in which the calibre of the lower end of the trachea is very inconsiderable, and the syrinx is correspondingly difficult to investigate. The tracheal rings are not modi-

[1] *Loc. cit.* plate iv. figs. 9–11.

fied, except the last, which is developed into a three-way piece from the presence of a bar running from before backwards at the middle of the lower margin. The first bronchial half-ring is of the same flattened and deep nature as the tracheal rings, and, like them also, is not separated from the three-way piece by any interval. To its anterior end, on each side, as well as to the front of the three-way piece, the intrinsic muscle is attached, which descends, broad and thin, down the front of the lower part of the trachea, in contact with its fellow of the opposite side, there to terminate (*vide* Plate LIII. fig. 8).

The second bronchial semi-ring is not modified. It is separated by a short interval from the first, and by a strikingly considerable one from the third, which is the commencement of the normal bronchus. I could not find that the muscles of the syrinx sent any fibres to this second ring, as in *Pachyrhamphus atricapillus*, described by Müller, although otherwise this structure is almost identical in the two birds. If they are present they must be extremely feeble; and the relative distances of the upper bronchial semi-rings favours the view that some special arrangement exists.

The account, above given, of the voice-organs in the aberrant Passeres in question, is entirely confirmatory of the results arrived at by Johannes Müller. Both *Hylactes* and *Grallaria* are completely tracheophone, as he predicted they would be found to be, although they agree with one another, and differ from those previously described in having the syringeal end of the trachea less abruptly distinguishable as being composed of two parts. Neither *Lipaugus*, nor *Heteropelma*, nor *Hadrostomus* are far from the mesomyodian types already known, as far as their voice-organs are concerned, which structure clearly shows that our nomenclature is an inefficient one when it places *Hadrostomus* as far from *Pachyrhamphus* as either is from *Tityra*.

Again, also, that the Pipridæ and Cotingidæ should be considered to be different families is not borne out by the nature of the lower larynx; and it seems hardly possible to allow a difference in tarsal scutellation to constitute a family difference, when not borne out by more important points of internal structure.

EXPLANATION OF PLATE LIII.

Fig. 1. Syrinx of *Grallaria guatemalensis*, front view.
2. The same, back view.
3. The same, lateral view, from within, showing the fusiform *processus vocalis*.
4. Syrinx of *Hylactes megapodius*, front view.
5. The same, back view.
6. Syrinx of *Lipaugus cineraceus*, front view.
7. The same, side view.
8. Syrinx of *Hadrostomus aglaiæ*, front view.

10. Notes on a small Collection of Land and Freshwater Shells from South-east Madagascar, with descriptions of new Species. By George French Angas, C.M.Z.S., F.L.S., &c.

[Received June 2, 1877.]

(Plate LIV.)

Mr. Edward Bartlett has placed in my hands for examination a small collection of land and fluviatile shells collected by Mr. Waters at Ekongo, on the south-east coast of Madagascar. It contains the following species:—

Achatina acuta, Fér.
Helix cornu-giganteum, Lam.
—— *farafanga*, H. Ad.
—— *souverbei*, Fisch.
—— *sepulchralis*, Fér., and vars.
—— *omphaloides*, Pfr.
—— *calypso*, Pfr.
—— *xystera*, Valenc., and vars.
—— *devali*, Petit.
Megalostoma crocea.
Cyclotus macareæ, Petit.
Cyclostomus bicarinatus, Sow., and several varieties.
—— *boivini*, Pfr.
—— *tricarinatus*, Lam.
—— *multifasciatus*, Grate.
Melania amarula, Lam.
Melania, sp.?
Navicella lineata, Lam.
—— *eximia*.
Lymnæa natalensis, Krauss, large var.
Nerita caffra, Wood.

Bulimus balstoni, n. sp. (Plate LIV. fig. 7.)

Shell imperforate, elongately ovate, somewhat thin, shining, irregularly longitudinally striated, and crossed here and there with concentric lines, giving portions of the surface somewhat of a tessellated appearance, rich chestnut-brown, paler towards the apex; spire elongately conical, somewhat obtuse at the apex; whorls 7, slightly convex, the last longer than the spire; sutures impressed, margined, and crenulated; aperture ovately oblong, bluish purple within; outer lip slightly arcuate, and a little thickened at the edge; inner lip with a strong callus, which is slightly flattened and expanded over the columella.

Alt. 3 inches 9 lines, diam. 1 inch 4 lines; length of aperture 1 inch 6 lines, breadth 9 lines.

Hab. Ekongo, S.E. coast of Madagascar.

This fine *Bulimus* must not be confounded with *B. clavator* of Petit de la Saussaye, another Madagascar species. They are distinct in form, texture, and other characters.

At the request of Mr. Edward Bartlett I have called this species after Mr. R. J. Balston.

Helix watersi, n. sp. (Plate LIV. figs. 3 *a*, 3 *b*.)

Shell with a small compressed umbilicus, discoidal, rather solid; obliquely closely striated with irregular, somewhat undulating, erect striæ, which are crossed by numerous concentric lines, exhibiting here and there a minutely reticulated appearance at the points of crossing,

light purplish brown, becoming darker behind the lip, partially covered with a pale straw-coloured epidermis; spire depressed, whorls 4, rapidly increasing, somewhat convex, the last very wide, swollen, bluntly keeled, with a slight depression above the keel; aperture nearly horizontal, transversely lunately ovate, margined within with a broad band of purplish black, interior pale lilac; peristome thickened, expanded, and reflected, edged with white; margins approximating and joined by a callus.

Diam. maj. 1 inch 8 lines, min. 1 inch 3½ lines, alt. 9 lines.

Hab. Ekongo, S.E. coast of Madagascar.

This interesting shell may at once be distinguished from *H. sepulchralis* and its allies by its elaborate sculpture, and by the expanded form of the aperture.

HELIX EKONGENSIS, n. sp. (Plate LIV. fig. 4.)

Shell minutely umbilicated, depressedly globose, very thin, the oblique lines of growth crossed by exceedingly fine, close-set, concentric lines, pale horn-colour, with one narrow brown band above the suture on the upper whorls, and two on the last whorl, one on either side of the periphery; spine depressedly conical, apex obtuse; whorls 6, flatly convex, the last not descending; aperture oblique, lunately ovate; outer thin, simple.

Diam. maj. 11 lines, min. 10 lines, alt. 6 lines.

Hab. Ekongo, S.E. Madagascar.

HELIX BALSTONI, n. sp. (Plate LIV. fig. 5.)

Shell imperforate, depressedly conoidal, thin, sculptured all over with extremely fine, close-set, engraved lines that cross each other obliquely both ways, giving the surface a delicately shagreened appearance under the lens, fulvous horn-colour throughout; spire depressedly conical, apex somewhat obtuse; whorls 6, flatly convex, the last sharply keeled at the periphery, not descending in front; base convex, shining; aperture oblique, quadrately ovate; outer lip thin, simple.

Diam. maj. 1 inch 2 lines, min. 1 inch, alt. 7 lines.

Hab. Interior of Madagascar.

In form, this species greatly resembles *Helix semidecussata*, Pfr., from India; but the sculpture of the whorls is quite different, and is remarkable for its extreme delicacy and beauty.

At the request of Mr. Edward Bartlett I have named this shell after Mr. W. E. Balston.

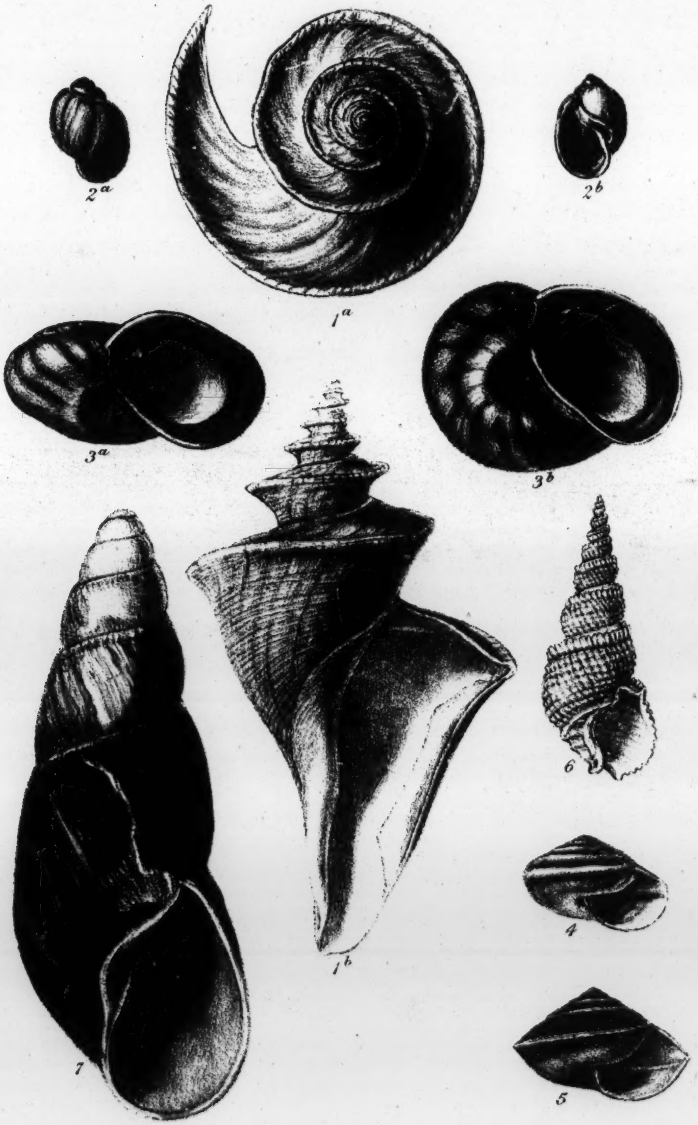
PHYSA MADAGASCARIENSIS, n. sp. (Plate LIV. figs. 2 *a*, 2 *b*.)

Shell sinistral, perforate, thin, longitudinally plicately striated, the striæ being more regular on the upper whorls, horn-coloured; spire obtusely conical, apex blunt; whorls 4½, convex, the last large and inflated; aperture ovate, narrower above; outer lip thin, simple, arcuate; columella with a broad callus expanded over the umbilical region.

Alt. 8 lines, diam. 5½ lines.

Hab. Okongo, S.E. Madagascar.





G Sowerby lith

M & N Hanhart imp

NEW SHELLS FROM MADAGASCAR

11. Descriptions of a new Genus of Gasteropodous Mollusca from Japan, and of a new Species of *Bullia* from Kurrachi. By George French Angas, C.M.Z.S., F.L.S., &c.

[Received June 2, 1877.]

(Plate LIV.)

Subfamily Fusinæ.

Thatcheria, new genus.

Shell angularly pyriform, solid; spire prominent, shorter than the aperture, many-whorled, whorls flattened above, strongly keeled at the periphery and contracted below; aperture with a broad incurved sinus between the extremity of the last keel and the junction of the body-whorl; basal canal wide and open; columella smooth; outer lip simple below the sinus.

Thatcheria mirabilis, n. sp. (Plate LIV. figs. 1 *a*, 1 *b*.)

Shell angularly pyriform, solid, yellowish white; spire elevated, and acuminate towards the apex; whorls 8, flattened, and slightly excavated above, strongly and prominently keeled at the periphery, and sloping inwards below, above the keels finely arcuately striate, below irregularly more or less crenately concentrically ridged; aperture triangularly subquadrate, pure white, and shining within; columella smooth, slightly arcuate above, nearly straight below, white; outer lip with a broad excavated sinus extending from its juncture with the body-whorl to the extremity of the last keel; below the keel, which is very prominent, the lip is simple and arcuate.

Alt. 3 inches 6 lines. Diam. 2 inches. Length of aperture 2 inches 2 lines.

Hab. Seas of Japan.

This very remarkable shell, quite unlike anything hitherto met with, was recently brought from Japan by Mr. Charles Thatcher. The specimen is believed to be unique. Without a knowledge of the operculum, its exact generic position cannot be determined; but at present I regard it as belonging to the subfamily Fusinæ.

Bullia (Leiodomus) kurrachensis, n. sp. (Plate LIV. fig. 6.)

Shell acuminately turreted, solid, white, tinged with rose-colour on the upper whorls; spire elongated, apex very sharp; whorls 9, somewhat convex, excavated and strongly keeled below the sutures, regularly transversely ribbed and longitudinally ridged with the lines of growth, the ridges becoming more or less imbricate and angled upon the keel, overlapping each other and forming a slight irregular coronation, last whorl with a sharp keel near the base; aperture ovate, outer lip simple.

Alt. 1 inch 9 lines. Diam. 9 lines.

Hab. Kurrachi, Scinde, N.W. India.

The type specimen of this elegantly turreted species was obtained

a short time ago on the beach near Manora Point, Kurrachi, by my daughter, Mrs. John Bruce. I have placed it in the British Museum.

EXPLANATION OF PLATE LIV.

Figs. 1 *a*, 1 *b*. *Thatcheria mirabilis*, p. 529.
2 *a*, 2 *b*. *Physa madagascariensis*, p. 528.
3 *a*, 3 *b*. *Helix watersi*, p. 527.
Fig. 4. *Helix ekongensis*, p. 528.
5. —— *balstoni*, p. 528.
6. *Leiodomus kurrachensis*, p. 529.
7. *Bulimus balstoni*, p. 527.

June 19, 1877.

E. W. Holdsworth, Esq., F.Z.S., in the Chair.

The Secretary made the following report on the additions to the Society's Menagerie during May 1877 :—

The total number of registered additions to the Society's Menagerie during the month of May was 164, of which 15 were by birth, 82 by presentation, 34 by purchase, while 21 were received in exchange, and 12 on deposit. The total number of departures during the same period, by death and removals, was 161.

The most noticeable additions during the month were :—

1. Seven Raccoon-like Dogs (*Nyctereutes procynides*) born in the Menagerie on the 2nd May. We are fortunate, as I have already remarked (P. Z. S. 1876, p. 695), in having an example of both sexes of this scarce species of *Canis* in our collection, and still more fortunate that they have bred with us and produced such a large litter.

2. A Pangolin (*Manis tricuspis*) purchased May 24th from Mr. Cross, of Liverpool, being, so far as I know, the first example of this remarkable form of the Edentata that has ever reached us alive.

The animal, which, I regret to have to add, died on the 27th ult. from debility consequent upon ulceration of the tongue, is a male, probably not quite mature. It measures 28½ inches in length, the body being 13½ and the tail 15 inches long. There are 7 series of scales on the head, 20 or 21 on the back, and 38 on the tail (see woodcut, p. 531).

Prof. Garrod promises to give us a full account of the anatomy of this interesting animal, of which there is still much to be learnt.

3. An African Buzzard (*Buteo tachardus*), captured in the Red Sea, and presented by Mr. Andrew Anderson, F.Z.S., May 22nd, 1877.

Mr. Anderson sends me the subjoined note on the capture of this bird :—

On the afternoon of the 27th April, while off the Zebayer Islands, in the Red Sea, about midway between the coast of Africa and Arabia [lat. 15° 2′ N., long. 42° 18′ E.], a large flight of big-looking birds suddenly made their appearance; and, so far as I could count them, some 15 or 20 remained with the S.S. 'Europa,' settling now and again on the rigging.

During the night four were captured; but I only succeeded in becoming possessed of two, which, judging from the difference in their size, must have been ♂ and ♀. The smaller one, presumably



Manis tricuspis, from a drawing by Mr. Wood, F.Z.S., published in the 'Illustrated London News' for July 28th, 1877.

the ♂, was in a very rufous or rather ochreous-red phase of plumage; this one, I regret to say, died the day before we reached Liverpool.

The one that has been placed in the Gardens is of a brown colour, and I should say is a ♀ bird. The four specimens I examined in life varied considerably in plumage, as much so as *Buteo ferox* does.

4. A Guianan crested Eagle (*Morphnus guianensis*), purchased May 23rd, and said to have been received from the Upper Amazons. This is the first example of this remarkable bird of prey that we have received alive.

5. A one-wattled Cassowary (*Casuarius uniappendiculatus*), obtained from the Royal Zoological Society of Amsterdam on the 24th May. This is a not quite adult example of this fine Cassowary, of which we have previously had but a single young specimen in the collection[1].

6. A male of the new Mesopotamian Fallow Deer, lately described and figured by Sir Victor Brooke in the Society's Proceedings (see P. Z. S. 1875, p. 261, pl. xxxviii., and 1876, p. 298). This fine animal was obtained for the Society through the exertions of Mr. Robertson, H.B.M. Vice-Consul at Bussorah, and brought to this country (very appropriately!) by the S.S. 'Mesopotamia,' Capt. Phillips, of whom it was purchased for the sum of £50. It is a

[1] See P. Z. S. 1875, p. 85, pl. xx.

male, very tame, and in excellent health, and is now growing a pair of those singular horns which render it so easily distinguishable from the common Fallow Deer.

7. An animal sold to us on the 29th May by Mr. Arthur Mosenthal as a Cheetah, but which appears to belong to a new species of the genus *Felis*, distinct from, although closely allied to that animal.

It is a male, probably not quite fully grown. It presents generally the appearance of a Cheetah (*Felis jubata*), but is thicker in the body, and has shorter and stouter limbs, and a much thicker tail. When adult it will probably be considerably larger than the Cheetah, and is larger even now than our three specimens of that animal. The fur is much more woolly and dense than in the Cheetah, as is particularly noticeable on the ears, mane and tail. The whole of the body is of a pale isabelline colour, rather paler on the belly and lower parts, but covered all over, including the belly, with roundish dark fulvous blotches. There are no traces of the black spots which are so conspicuous in all the varieties of the Cheetah which I have seen, nor of the characteristic black line between the mouth and eye.

Until we know more about this animal, and further examples of it have been obtained, it is perhaps too early to say that we have here a new species amongst the larger Cats; but after having looked through the descriptions of the varieties of the Cheetah given by different authors, and having especially studied the descriptions of the *Felis jubata* and *F. guttata*, as distinguished by Wagner, I believe it impossible to associate the present animal with any of them, and I propose to give it the temporary designation of *Felis lanea* or Woolly Cheetah. Mr. Mosenthal informs me that this animal, though shipped at Cape Town, was originally procured from Beaufort West in the Cape Colony. It is difficult to understand how such a distinct animal can have so long escaped the observations of naturalists.

Mr. Bartlett, by whom my attention was first directed to it, tells me that he has examined many Cheetah's skins from Africa, but never saw one any thing like that of the present animal. We have had in the collection Cheetahs from South Africa, Eastern Africa, Syria, and India, and have no doubt they all belong to one species. At the present moment we have in the Gardens examples of both African and Indian forms.

Mr. Smit's drawing (Plate LV.), together with the preceding notes, will, I trust, serve to make the differences between *Felis lanea* and *F. jubata* intelligible to naturalists [1].

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[1] At first one might be inclined to suppose that our animal was the *Felis jubata* of Duvernoy (Mém. Mus. d'H. N. Strasbourg, ii. p. 10), as distinguished by him from *Felis guttata*, as follows:—

"Le *felis jubata* se distingue par sa *robe jaune nankin parsemée partout, même sous le ventre*, de taches *rondes, de couleur foncée*. Il l'est encore par *des formes plus épaisses et une assez forte crinière*.

"Le *felis guttata* en diffère par *des formes plus grêles, des jambes plus hautes, son pelage d'un fauve orangé* foncé ou clair, *parsemé* de *taches rondes et noires*, excepté en dessous, où il est quelquefois d'un blanc pur et sans aucune tache ou n'en a que de ternes."

But on looking more narrowly into Duvernoy's description, particularly to his

P.Z.S. 1877 Pl. LV.



J. Smit. lith.

Hanhart imp.

FELIS LANEA



The Secretary read an extract from a letter addressed to him by Monsieur J. M. Cornely, C.M.Z.S., dated Château Beaujardin, Tours, France, June 5th, stating that his female *Hydropotes inermis*, which had been impregnated by the Society's male, sent to Tours for that purpose, had just produced three young ones, one of which, however, had been born dead; the dead one weighed 1175 grammes, and was about 45 centims. in length.

Mr. J. E. Harting, F.Z.S., exhibited a variety of the Common Snipe, and made the following remarks:—

The Snipe which I have the pleasure of exhibiting this evening is remarkable from the circumstance that the colour of the plumage is exactly intermediate between that of the Common Snipe and the so-called Sabine's Snipe. It seems, indeed, to form a connecting link, as is were, between the two, and to lead to the conclusion (already shared in by many ornithologists) that the so-called Sabine's Snipe is not a valid species, but a melanism of the Common Snipe.

Some years ago, before I had examined as many specimens of Sabine's Snipe as I have since seen, I thought from various characters (such as the absence of the longitudinal half-lines on the dorsal plumage, and the ovate shape of the feathers generally) that Sabine's Snipe might be a good species; but having now examined some fifteen or sixteen different specimens, I am inclined to believe that the ovate shape of the feathers is characteristic of age, and indicates a young bird, and that the so-called species ought to be regarded simply as a melanism of the common species.

The specimen now exhibited was killed in Ireland last Christmas; and a brief notice of it will be found in the 'Zoologist' for January last, pp. 24, 25.

Mr. B. Tegetmeier, F.Z.S., exhibited a specimen of the sternum of the Tawny Owl (*Syrnium aluco*) which presented a curious malformation. There was a complete absence of ossification down the middle line, the moieties of the sternum, in contact superiorly, being widely divergent inferiorly, although each was quite of normal form. The furcula was not peculiar.

Mr. John Murray, C.M.Z.S., Naturalist of the 'Challenger' Expedition, exhibited and made remarks on a series of Shark's teeth, Whale's ear-bones, and other specimens dredged up during the voyage of the 'Challenger.'

Prof. Garrod, F.R.S., read a description of the brain of the Sumatran Rhinoceros.

This paper will be published in the Society's 'Transactions.'

The following papers were read:—

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reference to the black line below the eye in his *F. jubata*, I think it impossible to identify it with the present animal.

1. Reports on the Collections of Birds made during the Voyage of H.M.S. 'Challenger.'—No. I. General Remarks on the Collections.

By P. L. Sclater, M.A., Ph.D., F.R.S.

[Received May 24, 1877.]

At the request of Sir C. Wyville Thomson, I have had great pleasure in undertaking the determination of the skins of birds collected during the voyage of H.M.S. 'Challenger' round the world in the years 1874–6. The whole collection embraces about 900 specimens in skins, besides which there is a considerable series of sea-birds in salt and spirit, which will be used principally for anatomical purposes, and a collection of eggs, principally of oceanic species.

The collection was formed under the superintendence of Mr. John Murray, one of the naturalists of the Expedition, and the skins chiefly prepared by Mr. Frederick Pearcey, who accompanied the vessel as taxidermist. They are, nearly without exception, in an excellent state of preservation.

Mr. Murray has placed at my disposal his ornithological note-book, which contains the history of every individual specimen, and many other particulars, which add greatly to the value of the collection.

It will be recollected that the main object of the 'Challenger' Expedition was the exploration of the depths of the ocean, and that the collecting of birds of any sort, especially land birds, formed but a very subordinate part of the original plan. Ornithologists must therefore not be surprised that so small a collection was made during a three years' voyage, but rather be very thankful to Sir C. Wyville Thomson and his coadjutors for having devoted so much extra attention to a branch of science in which investigations were not required of them.

For the purpose of study, I have divided the collection of bird-skins as follows:—

A. Terrestrial Birds.
B. Oceanic Birds.

The Terrestrial Birds fall into the following ten geographical categories, to which I have added the approximate number of skins:—

1.	*Atlantic Islands, i. e.* Tristan da Cunha and Inacessible	12
2.	*Kerguelen Land*	16
3.	*Cape York, Australia*	60
4.	*Aroo Islands*	62
5.	*Moluccas, i. e.* Banda, Ternate, Amboyna, and Ké	70
6.	*Philippines*	95
7.	*Admiralty Islands*	56
8.	*South Pacific Islands, i. e.* Friendly Islands, Fijis, New Hebrides, and Tahiti	135
9.	*Sandwich Islands*	24
10.	*Antarctic America*, Juan Fernandez, and Falklands	149
	Total approximate number of skins	679

Besides these a few specimens (26 in all) were obtained at Hongkong, China, Japan, New Zealand, St. Jago, Cape Verd, and one or two other localities, but nothing like series which necessitate special examination.

Under the head *Oceanic* Birds I place the members of the following families, which are most conveniently studied as groups:—

Laridæ	47	specimens
Procellariidæ	80	„
Steganopodes	33	„
Spheniscidæ	38	„
Total. .	198	„

To aid me in my task I have been fortunate enough to obtain the valuable assistance of the Marquess of Tweeddale, our President, for the determination of the Philippine Birds, of Mr. O. Salvin as regards the Procellariidæ, of Mr. Howard Saunders for the Laridæ, of Dr. Finsch for the birds of the South Pacific Islands; and I hope to get that of Count T. Salvadori for some of the Moluccan and Papuan birds.

The members of the other groups I trust to be able to determine myself personally or in conjunction with my constant fellow-worker Mr. O. Salvin.

With the approbation of Sir C. Wyville Thomson I propose to communicate the results of the investigations of these gentlemen and myself on this subject to the Society in a series of reports, which will be accompanied by extracts from Mr. Murray's ornithological journal.

2. Reports on the Collections of Birds made during the Voyage of H.M.S. 'Challenger.'—No. II. On the Birds of the Philippine Islands. By Arthur, Marquis of Tweeddale, F.R.S., President of the Society.

[Received June 8, 1877.]

The 'Challenger' Expedition, during its stay in the Philippine archipelago, visited six islands, viz. Panay (Ilo-ilo), Luzon (Manila), Zebu, Camiguin, Malanipa, and Mindanao (Zamboanga and Pasananca). It is not on record that two of these islands, Camiguin and Malanipa, had ever been previously visited by any ornithological collector; while from Mindanao only some nineteen species of birds were known. Dr. Steere, at about the time the 'Challenger' was near Mindanao, collected many additional species of birds on that island, as he had also done in the islands of Zebu and Panay; and as the results of his researches have already been made known by

Mr. Bowdler Sharpe[1], some of the discoveries made by the 'Challenger' naturalists have been anticipated. In order that the exact course taken by the 'Challenger' may be recorded, with the dates on which the expedition arrived at and departed from the different islands, I transcribe the following extracts from Mr. J. Murray's ornithological note-book, adding to each extract the names of the birds, as I have determined them:—

"Ship arrived at Ilo-ilo on the 28th [October 1874], at 5 P.M. On the 30th the following birds were shot. These are all from the island opposite the town:—

[*Osmotreron axillaris.*
Broderipus acrorhynchus.
Loriculus panayensis.
Entomobia gularis.
Sauropatis chloris.
Pelargopsis gigantea?
Centrococcyx viridis.
Corvus philippinus.
Corydalla lugubris.
Lalage dominica.
Orthotomus castaneiceps.
Arachnechthra jugularis.]

"The ship arrived at Manila on the 11th January, 1875, and left there on the 14th January. The following two birds were shot from the ship during the stay:—

[*Larus ridibundus.*
Hydrochelidon hybrida.]

"The ship arrived at Zebu on the 18th January, 1875, and left on the 24th. During the stay Percy and some of the officers shot the following birds:—

[*Broderipus acrorhynchus.*
Artamus leucorhynus.
Sauropatis chloris.
Haliastur intermedius.
Numenius phæopus.
Demiegretta sacra.
Hypsipetes philippinensis.
Lanius lucionensis.
Merops philippinus.]

"Parties landed on the volcanic island of Camiguin on the 26th January, 1875, for a few hours in the afternoon, and the following birds were shot:—

[*Corvus philippinus.*
Calornis panayensis.
Sauropatis chloris.
Arachnechthra jugularis.
Tringoides hypoleucos.]

"On the 30th of January a party landed, early in the morning, on the island of Malanipa, Basilan Straits, near Zamboanga, and returned to the ship at 2 P.M. The following birds were shot:—

[*Eudynamis mindanensis.*
Myristicivora bicolor.
Haliastur intermedius.
Tanygnathus lucionensis.
Pelargopsis gigantea.
Numenius phæopus.
Nectarophila juliæ.
Totanus incanus.
Hypothymis azurea.]

[1] Trans. Linn. Soc. ser. 2, Zool. vol. i. I am much indebted to Mr. Sharpe for his courtesy in permitting me to peruse his paper while it was passing through the press. Without this assistance it would have been impossible for me to have completed this report at so early a date.

"On the 1st February, 1875, a party of four officers and three men left the ship with tent &c., and went up to the high land beyond Zamboanga. The tent was pitched in a valley called Pasananca, at a distance from Zamboanga of some seven miles. The tent and baggage had to be transported on horseback. The party remained at the spot the 2nd, 3rd, and 4th, and returned to the ship on the 5th, at about midday. The following birds were obtained by the party, and were skinned by Percy at the tent:—

[*Buceros mindanensis.*
Broderipus acrorhynchus.
Merops philippinus.
—— *bicolor.*
Entomobia gularis.
Pelargopsis gigantea.
Dicrurus striatus.
Hypsipetes rufigularis.
Ixus goiavier.
Phabotreron brevirostris.
Batrachostomus septimus.
Harpactes ardens.
Erythropitta erythrogastra.
Chrysocolaptes lucidus.
Prioniturus discurus.
Calobates melanops.
Dicæum mindanense.
Haliastur intermedius.
Tringoides hypoleucus.
Eurystomus orientalis.
Rhynchæa capensis.
Gallinago stenura.]"

Two more species were obtained at Zamboanga, which are not included in Mr. Murray's notes:—

Charadrius fulvus.
Sterna bergii.

It will be seen that twelve species were obtained in Panay, two in Luzon, nine in Zebu, five in Camiguin, nine in Malanipa, and twenty-four in Mindanao.

Mr. Murray's field-notes will be found added under the head of each species, included in brackets, together with the collection-numbers.

The ornithological results of the 'Challenger's' short stay in the Philippine archipelago may be summarized as follows:—

Specimens obtained, 98.
Species obtained, 49.
New species obtained, 7:—

Loriculus panayensis.
Batrachostomus septimus.
Dicrurus striatus.
Nectarophila juliæ.
Buceros mindanensis.
Dicæum mindanense.
Phabotreron brevirostris.

Genera added, 2:—

Batrachostomus.
Demiegretta.

Habitat determined within the archipelago, 1:—

Rhynchæa capensis.

Habitat corrected, 1:—

Chrysocolaptes lucidus.

Known species added to the Philippine fauna, 4:

Totanus incanus.
Gallinago stenura.
Demiegretta sacra.
Sterna bergii.

Range of known Philippine species extended within the archipelago, 23 :—

	Malanipa.	Mindanao.	Camiguin.	Panay.	Zebu.
Tanygnathus lucionensis	*				
Haliastur intermedius	*	*	.....	.....	*
Merops philippinus	.....	.....	.....	.....	*
Pelargopsis gigantea	*				
Entomobia gularis	.....	*			
Sauropatis chloris	.....	.....	*	*	
Eudynamis mindanensis	*				
Artamus leucorhynchus	.....	.....	.....	.....	*
Hypothymis azurea	*				
Broderipus acrorhynchus	.....	.....	.....	*	
Ixus goiavier	.....	*			
Hypsipetes rufigularis	.....	*			
Calobates melanope	.....	*			
Corydalla lugubris	.....	.....	.....	*	
Arachnechthra jugularis	.....	.....	*		
Corvus philippinus	.....	*	*	*	
Calornis panayensis	.....	.....	*		
Munia jagori	.....	*			
Osmotreron axillaris	.....	.....	.....	*	
Myristicivora bicolor	*				
Charadrius fulvus	.....	*			
Numenius phæopus	*				
Tringoides hypoleucos	.....	*	*		
	7	9	5	5	3

1. PRIONITURUS DISCURUS.

Psittacus discurus, Vieill. Gal. des Ois. i. p. 7, t. 76, "Mindanao" (1825).

Prioniturus discurus, Walden, Trans. Zool. Soc. ix. p. 132. no. 2.

[No. 431, ♂. Pasananca. Eyes grey. It frequents the banana-trees, and feeds on their fruit, of which the stomach was full.]

Luzon and Guimaras individuals do not differ from this typical example.

2. TANYGNATHUS LUCIONENSIS.

Psittacus lucionensis, Linn. Syst. Nat. i. p. 146. no. 31 (1766); Walden, *t. c.* p. 133. no. 8.

[No. 399, ♂. Malanipa. Eyes white.]

Does not differ from typical examples. The locality is new.

3. LORICULUS PANAYENSIS, n. sp.

"*Loriculus regulus*, Souancé," Sharpe, Trans. Linn. Soc. ser. 2, Zool. vol. i.

[No. 348, ♂. } Ilo-ilo. Eyes brown; feet orange; bill red. Sto-
No. 349, ♀. } mach had seeds.]

♂. Grass-green, below lighter. Forehead and sinciput bright blood-red; vertex and occiput green, washed with golden yellow; a narrow band, separating the red sinciput from the golden vertex, yellow. A golden mark across the nape. Uropygium and upper tail-coverts dark scarlet. A decided line round the mouth and base of mandible verditer-blue. Breast yellowish green. Outer webs of quills dark green, inner black, above; quills underneath black, most of the inner webs of primaries being blue, and all of the inner webs of the remaining quills. Rectrices dark green, blue underneath. Short under wing-coverts dark green, longer blue. Bill coral-red.

♀. Like the male, but differs in having the vertex and occiput green, and no blue round the mouth.

	Wing. in.	Tail. in.	Tarsus. in.	Bill from nostril. in.
♂.	3·62	2·12	0·37	0·43
♀.	3·56	2·00	0·37	0·43

This species above closely resembles *L. regulus*, ex Negros, but differs in wanting the red pectoral patch and in having blue feathers at the base of the mandible. The female only differs from that of *L. regulus* in having no blue feathers round the mouth, though a few are present at the top of the throat.

Dr. O. Finsch has remarked (Ibis, 1874, p. 208) that *L. chrysonotus* has no orange mark on the nape; but I find this mark very conspicuous in a specimen belonging to my series of the species, ex Zebu.

4. HALIASTUR INTERMEDIUS.

Haliastur intermedius, Gurney, Ibis, 1865, p. 28; Walden, *t. c.* p. 142. no. 17.

[No. 373, ♂. Zebu. Eyes brown. Shot from the ship at the anchorage at Zebu.

No. 374, ♂. Zebu. Eyes brown. Stomach contained offal.

No. 398, ♂. Malanipa. Eyes yellow.

No. 434, ♂. Pasananca. Eyes brown.]

Not previously recorded from these three localities.

5. CHRYSOCOLAPTES LUCIDUS.

Picus lucidus, Scop, Del. Fl. Faun. Insubr. ii. p. 89. no. 51 (1786); Walden, *t. c.* p. 147. no. 32.

[No. 430, ♂. Pasananca. Eyes red.]

Unless *C. maculiceps*, Sharpe (*t. c.*), belongs to this species, this Mindanao specimen appears to be the first that has been brought to Europe since Sonnerat's day; for now that I have the opportunity of comparing it with *C. hæmatribon*, I doubt the correctness of the identification of Jagor's young bird *ex* Luzon by Dr. v. Martens (J. f. Orn. 1866, p. 20. no. 110), and for the reason that, first, *C. lucidus* is a representative form of *C. hæmatribon*, and secondly, if a Luzon bird, it would have been found by some one of the collectors who have well worked the vicinity of Manila since Sonnerat collected in its neighbourhood. If this be so, Sonnerat must have obtained his own type specimen and that of Buffon, not

in Luzon, but at or near Zamboango, where the naturalists of the 'Challenger' procured this one. The species is accurately described, from Sonnerat's type specimen in the Paris Museum, by Malherbe (Monogr. Picidæ, ii. p. 85), although his figure (*op. cit.* t. 16. fig. 3) shows too little carmine and too much golden on the wings, and thus is inconsistent with his own description.

Mr. Sharpe's type specimen has unfortunately gone to America. It was obtained in Basilan by Mr. Steere, and, from the description and specific title, seems to have been a male in imperfect plumage. It has the concealed white spots on the webs of the outer rectrices, which constitute one of the peculiar characters of *C. lucidus*. Sonnerat, in his plate (Voy. N. Guin. pl. 37), exhibits these spots on all the rectrices; but this is an error. If not the same as *C. lucidus*, *C. maculiceps* is a very closely allied representative form. *C. lucidus*, together with *C. xanthocephalus* and *C. hæmatribon*, form a small subgroup of which the only other member occurs in Ceylon (*C. stricklandi*); but *C. lucidus*, with its partly golden wings, seems to be a connecting link with the typical species of *Chrysocolaptes*.

6. HARPACTES ARDENS.

Trogon ardens, Temm. Pl. Col. 404, ♀, "Mindanao" (1826); Walden, *t. c.* p. 149. no. 34.

[No. 428, ♂. Pasananca. Legs bluish; bill orange; eyes hazel. Stomach had insects.]

Luzon males do not differ from this typical example.

7. MEROPS PHILIPPINUS.

Merops philippinus, Linn. Syst. Nat. ed. 13 (Vindob.), i. p. 183. no. 5 (1767); Walden, *t. c.* p. 149. no. 35.

[No. 380, ♂. Zebu. Eyes red.

No. 412, ♂. } Pasananca. Bill and feet black. Eyes red.]
No. 413, ♀. }

These examples in no respect differ from Luzon and Negros individuals, or, indeed, from examples from any part of the Indian region. Not hitherto recorded from Zebu.

8. MEROPS BICOLOR.

Merops bicolor, Bodd. Tab. Pl. Enl. p. 15. no. 252 (1783); Walden, *t. c.* p. 150. no. 36, t. xxvi. f. 1.

[No. 414, ♂. Pasananca. Eyes red; feet violet (slightly).]

Both the above species of Bee-eaters were common about the camps, and seemed to associate much together and to have the same habits. Not to be distinguished from Luzon and Negros individuals.

9. EURYSTOMUS ORIENTALIS.

Coracias orientalis, Linn. Syst. Nat. i. p. 154. no. 4 (1766); Walden, *t. c.* p. 152. no. 37.

[No. 436. ? Pasananca. Feet and bill red; tip of mandible black.]

Agrees with Ceylon examples as well as with those from localities already mentioned (*l. c.*).

10. Pelargopsis gigantea.

Pelargopsis gigantea, Walden, Ann. & Mag. Nat. Hist. ser. 4, xiii. p. 123 (1874).

[No. 352, ♂. Ilo-ilo. Eyes black; feet red; bill red, tipped with black. Stomach had fish.

No. 400, ♀. Malanipa. Eyes black.

No. 417, ♂. Pasananca. Eyes black; bill and legs red. Had in the stomach an eel about 6 inches long.]

The example from Malanipa (No. 400), from which island the species has not been hitherto recorded, and the one from Pasananca (No. 417) are somewhat smaller than the type specimen of *P. gigantea*, but in other respects do not differ specifically. In colouring the Malanipa bird is hardly distinguishable from the type; but the Mindanao example has the wings, scapulars, and interscapulars a much purer blue. The Panay bird (No. 352) has the same parts of a still purer blue (as opposed to greenish blue), and all the plumage, including the head, which is more or less white in the type, is creamy buff, most intense on the flanks, abdomen, and under tail-coverts.

Our acquaintance with the mutations of colouring and what they denote in many of the so-called species of this group is yet very limited; and I prefer to retain for the present the Ilo-ilo bird under the title above given.

The specimens measure as follows:—

	Wing. in.	Tail. in.	Bill from forehead. in.	Bill from gape. in.
Type, *ex* Sulu, near Borneo .	6·56	4·25	3·50	4·00
♂, *ex* Pasananca	6·00	4·00	3·25	3·56
♀, *ex* Malanipa	6·06	4·00	3·25	3·56
♂, *ex* Ilo-ilo.....	6·00	4·00	3·12	3·62

11. Entomobia gularis.

Alcedo gularis, Kuhl, Buff. & D'Auben. Fig. Av. Col. Nom. Syst. p. 4 (1820); Walden, *t. c.* p. 154. no. 44.

[No. 350, ♂. } Ilo-ilo. Eyes black; legs and bill dark red.
No. 351, ♂. } Stomach had insects.
No. 415, ♂. } Pasananca. Eyes black; feet and bill red.
No. 416, ♀. }]

Luzon, Negros, and Zebu individuals agree well with these Panay and Mindanao examples. The last island is a new locality for the species.

12. Sauropatis chloris.

Alcedo chloris, Bodd. Tabl. Pl. Enl. p. 49 (1783); Walden, *t. c.* p. 155. no. 47.

[No. 353, ♂. }
No. 554, ♀. } Ilo-ilo. Eyes black. Stomach had insects.
No. 371, ♂. }
No. 372, ♀. } Zebu. Eyes black.
No. 387, ♂. }
No. 388, ♀. } Camiguin.]

A Zebu male (No. 371) has the pectoral and flank feathers conspicuously margined with greyish brown; and this is observed in a less degree in a female (No. 354) from Ilo-ilo. Panay and Camiguin are new localities.

13. Batrachostomus septimus, n. sp.

[No. 427, ♀. Pasananca. Eyes brown. Stomach had insects.]

Rufous phase.—Head, interscapulars, and elongated occipital crest rufous brown, most of the feathers with a pair of pale rufous spots on either web, and defined by a narrow brown transverse bar. Elongated auriculars barred alternately with brown and rufous. A patch before the eye albescent rufous. A conspicuous nuchal collar formed by a series of very broad feathers brown at the base, then an irregular subdued brown transverse narrow band, followed by a pale rufous band, then another narrow zig-zag brown band, which is succeeded by another pale rufous band, bounded below by a broad transverse dark brown almost black band, which is succeeded by a still broader white band, bordered again with black; the white band is separated from the black above and below by a rusty margin. Feathers of the back, rump, and upper tail-coverts rufous, with irregular transverse brown markings, and in some with brown centres. Scapulars tawny rufous and pure rufous, irregularly marked with brown zigzags, several with a subterminal black mark and a terminal tawny rufous spot. Wing-coverts chestnut, with brown vermiculations; the greater coverts with large, pure white, ovoid terminal drops, mostly situated on the outer webs, and bounded above and on the inner margins with black. Quills brown on the inner webs, pale rufous on the outer, with obscure pale brown marks. Tertiaries pale rufous on the outer webs, much indented with the brown of the inner webs. Innermost tertiaries pale rufous on both webs, transversely marked with cloudy brown. Tips of several of the inner webs of the quills pale rufous. Rectrices pale rufous, traversed by several bars of rufous brown, each bar being bounded above and below by a brown line. Penultimate pair of rectrices with rufous spots, rather than bands. Exterior short pair with almost pure white spots on the inner web. Chin and throat dingy rufous, intersected by brown zigzag lines. A gular collar, formed of broad feathers with a broad subterminal pure white band, bounded below and above by a narrow dark brown band. Feathers of the upper breast dingy rufous freckled brown, pale tawny rufous at the base, with brown transverse lines and traces of white spots on the margins of some of the webs. Concealed lower breast- and flank-plumes mostly pure white, with dark grey markings near the base and terminated with rufous freckled with brown. Abdominal feathers pale albescent rufous, striated with brown, and some marked with pure white. Feathers of the ventral region isabelline white, with small obscure pale tawny rufous margins. Under tail-coverts isabelline, the longer with subterminal marks of brown and rusty. Under wing-coverts greyish white, banded with rufous brown. Thigh-coverts dark rufous brown. Stiff nasal plumes rufous, tipped brown. Wing 6 inches, tail 4·5, tarsus 0·68,

middle toe 0·75, bill (from forehead) 1·12, width of gape 1·37. The tarsus is feathered anteriorly for about one fourth of its length; the bill is massive.

14. EUDYNAMIS MINDANENSIS.

Cuculus mindanensis, Linn. Syst. Nat. i. p. 169. no. 3 (1766); Walden, *t. c.* p. 162. no. 61.

[No. 392, ♂. No. 393, ♂. No. 394, ♀. } Malanipa. Eyes red.]

Malanipa is a new locality for this species; but, from its proximity to Mindanao, the examples may be considered typical.

The two males are in full black plumage, with a green gloss. They have, however, a shorter wing than Guimaras examples, the only other Philippine examples I have been able to compare them with. The female is without a tail; and in the absence of any other Philippine individuals of that sex I can make no satisfactory comparisons.

	Wing. in.	Tail. in.	Bill, from nostril. in.	Tarsus. in.	Middle toe. in.
No. 392, ♂.	7·38	7·62	0·75	1·25	1·12
No. 393, ♂.	7·38	8·00	0·75	1·25	1·12
No. 394, ♀.	6·75	..	0·75	1·25	1·12

No. 392 has a pure white primary wing-covert.

Mindanao individuals remain a desideratum.

15. CENTROCOCCYX VIRIDIS.

Cuculus viridis, Scop. Del. Fl. Faun. Insubr. ii. p. 89. no. 47 (1786); Walden, *t. c.* p. 163. no. 64.

[No. 355, ♀. Ilo-ilo. Eyes red. Stomach had insects.]

A young bird, with many new feathers coming in. Old feathers of the body and tail brown. Examples from Luzon, Negros, Zebu, and Guimaras (*mus. nostr.*) do not differ from this typical specimen. There is no record of a Panay example having reached Europe since Sonnerat's time.

16. BUCEROS MINDANENSIS, n. sp.

[No. 407, ♂. No. 408, ♀. } Pasananca. Eyes yellowish grey; legs, base and knob of bill red; tips of upper and lower mandible white.

No. 409, ♀. Pasananca. Bill nearly uniform black, tinged with red; eyes blue. On the whole, appears a much younger bird.

The stomachs of all contained seeds and fruit, and grubs, centipedes, grasshoppers, &c. These birds make a loud sound, like a crow somewhat, and frequent the highest trees. Several times in the early morning we came upon them on the ground under the trees; and I rather think they scrape at the roots of trees for food.]

These examples belong to a representative form of *B. hydrocorax*, *ex* Luzon. They differ from that species in having a corrugated

plate on the basal part of the sides of the mandible, by the casque being narrower, by the general dimensions being less, and by the anterior three fourths of the mandible and about the anterior half of the maxilla being white, and the rufous of the thigh-coverts, of the head, nape, and throat being much darker.

♂ adult. Casque, posterior half of maxilla, rami of mandible, and posterior part of gonys blood-red. Corrugated lateral plates of mandible darker blood-red. Remainder of bill pale straw-white. Feathers surrounding the eye and clothing the base of mandible, chin, and gullet black. Head, nape, and upper part of breast, lower throat, and thigh-coverts deep rufous maroon. Upper throat tawny. Breast black. Interscapulars and wing-coverts ruddy brown. Upper tail-coverts ferruginous. Under tail-coverts and vent light dingy rust-colour. Quills black; secondaries narrowly margined externally with ferruginous, and tipped with rusty white. Rectrices ruddy ochre.

♀ adult. Like male, as is the case in *B. hydrocorax*.

♀ juv. Differs chiefly by the casque not being so fully developed anteriorly and not overhanging the true culmen, and in its culmen being dingy brown and grey-brown, with indications of red on the casque and at base of mandible. The grooved lateral plates have not appeared. The tarsus and feet in all appear to have been blood-red.

In true *B. hydrocorax* slight indications of grooves are perceptible on the walls of the base of the mandible; but they are cut in the substance of the mandible, and do not form part of an adhering plate.

	Wing.	Tail.	Tarsus.	Mid. toe.	Bill, from gape.	Casque.	
						Length.	Breadth.
	in.	in.	in.	in.	in.	in.	in.
B. hydrocorax ♂	16·00	14·25	3·00	2·00	7·00	5·75	2·30
B. mindanensis ♂.....	15·50	14·00	3·00	1·60	6·62	6·00	2·00
„ „ ♀.....	14·25	12·50	2·75	1·75	6·25	5·75	1·87
„ „ ♀ juv.	14·25	13·50	3·00	1·75	5·62	4·50	1·50

17. LANIUS LUCIONENSIS.

Lanius lucionensis, Linn., S. N. i. p. 135, No, 10 (1766); Walden, *t. c.* p. 171. no. 72, t. xxix. f. 1.

[No. 379, ♂. Zebu. Eyes hazel.]

18. ARTAMUS LEUCORHYNUS.

Lanius leucorhynus, Linn., Mantissa Plant. p. 524, "Imarishia" (1771); Walden, *t. c.* p. 174. no. 73.

[No. 369, ♂. } Zebu. Eyes brown. Stomachs had insects.]
No. 370, ♀. }

Not hitherto recorded from Zebu. Philippine examples of this species exhibit two slightly differing phases of dress, one in which the upper plumage is of a light bluish and cinereous colour, the

other where it is more of a smoky brown and bluish ash. This does not seem to depend on sex; for one of these examples (*ex* Zebu, No. 369) is marked ♂, while I possess a Luzon example exactly similar, which Dr. Meyer determined to be a ♀. The other Zebu example (No. 370) is marked ♀, and is in the paler bluish-grey attire.

19. LALAGE DOMINICA.

Turdus dominicus, L. S. Müller, Suppl. p. 145. no. 56 (1776); Walden, *t. c.* p. 178.

[No. 358, ♀. Ilo-ilo. Eyes brown. Stomach had insects.]

20. DICRURUS STRIATUS, n. sp.

[No. 418, ♂.
No. 419, ♂.
No. 420, ♀.] Pasananca. Eyes red; feet and bills black.

♂, ♀. Nasal and frontal plumes black; vertex and occiput clothed with glistening green-black scale-like feathers; nape, interscapulars, back, uropygium, and under surface velvety bluish black; feathers of lower throat and of breast with glistening, bluish-black, central, narrow lines, imparting a striated appearance; outer edges of the primaries (first and second excepted), exposed surface of all the remaining quills, all the wing-coverts and wing-lining, and the exposed surface of the rectrices glistening green-black; quills above and below and under surface of the webs of the laterals, black; bill and feet black; wing 5·37 inches, tail 4·62, tarsus 0·90, bill from forehead 1·44.

Of the same type as *D. balicassius*, with the tail but slightly forked.

21. HYPOTHYMIS AZUREA.

Muscicapa azurea, Bodd. Tab. Pl. Enl. p. 41 (1783); Walden, *t. c.* p. 182. no. 85.

[No. 406, ♂. Malanipa. Eyes hazel.]

An additional locality for this species.

22. HIRUNDO GUTTURALIS.

Hirundo gutturalis, Scop. Del. Fl. Faun. Insubr. ii. p. 96. no. 115 (1786); Walden, *t. c.* p. 184. no. 88.

[No. 362 (?). Caught on board the ship, Oct. 21, 1874, between the Moluccas and the Philippines.]

23. BODERIPUS ACRORHYNCHUS.

Oriolus acrorhynchus, Vigors, P. Z. S. 1831, p. 97, "Manilla;" Walden, *t. c.* p. 185. no. 90.

[No. 347, ♂. Ilo-ilo. Eyes white. Stomach had insects or, rather, grubs.
No. 365, ♂.
No. 366, ♂.
No. 367, ♀.
No. 368, ♀.] Zebu. Eyes red.]

[No. 410, ♂.
No. 411, ♀. } Pasananca. Eyes red; bill reddish.]

These examples all agree with typical. The difference of the colour of the iris in the Panay bird is curious; from that island the species has not hitherto been recorded.

24. Erythropitta erythrogastra.

Pitta erythrogastra, Temm. Pl. Col. 212 (1823); Walden, *t. c.* p. 187. no. 94.

[No. 429, ♂. Pasananca. Eyes black; feet slate-coloured. Insects in the stomach.]

The exact origin of the original type is not recorded; but I cannot detect any important difference between this Mindanao individual and examples from Luzon.

25. Ixus goiavier.

Muscicapa goiavier, Scop. Del. Fl. Faun. Insubr. ii. p. 96. no. 109 (1786); Walden, *t. c.* p. 190. no. 99.

[No. 343, ♂. Zamboanga.
No. 424, ♂.
No. 425, ♂. } Pasananca. Eyes hazel.]

New to Mindanao.

26. Hypsipetes philippinensis.

Turdus philippinensis, Gm. S. N. i. p. 814. no. 40 (1788); Walden, *t. c.* p. 191. no. 102.

[No. 378, ♂. Zebu. Eyes hazel.]

27. Hypsipetes rufigularis.

Hypsipetes rufigularis, Sharpe, Tr. L. S. ser. 2. Zool. vol. i.

[No. 421, ♂.
No. 422, ♂.
No. 423, ♀. } Pasananca. Eyes brown or hazel.]

The female is somewhat smaller, with a shorter bill. An addition to the fauna of Mindanao.

28. Orthotomus castaneiceps.

Orthotomus castaneiceps, Walden, Ann. N. H. (4) i. p. 252, "Guimaras" (1st Oct. 1872); Walden, Tr. Z. S. ix. p. 195. no. 113; Sharpe, Trans. Linn. Soc. ser. 2. Zool. vol. i.; id. Ibis, 1877, p. 114.

The type was a male; but this Panay female does not differ.

[No. 359, ♀. Ilo-ilo. Eyes brown. Stomach had insects.]

29. Calobates melanope.

Motacilla melanope, Pallas, Reisen Russischen Reichs, iii. p. 696. no. 16 (1776); Walden, *t. c.* p. 196. no. 114.

[No. 432, ♀. Pasananca.]

A female with greyish brown upper plumage; tail 3·56. Recorded for the first time from Mindanao.

30. CORYDALLA LUGUBRIS.

Corydalla lugubris, Walden, *t. c.* p. 198. no. 117 (1875).

[No. 357, ♂. Ilo-ilo. Eyes hazel. Stomach had seeds.]

Panay is an additional locality.

This example differs from the type in having the tertiaries and most of the wing-coverts broadly margined externally with pale rufous, not albescent. The pectoral feathers are tinged with pale rufous; and the brown central streaks are much broader than in the type. The flanks are washed with pale rufous.

31. DICÆUM MINDANENSE, n. sp.

[No. 433, ♂. Pasananca.]

♂. Above—cheeks and ear-coverts fuliginous olive-green. Below greyish white, most grey on the breast; quills dark brown, narrowly margined with olive-green on outer webs; tertiaries with the olive-green margins broader; rectrices dark brown, faintly edged with olive; axillaries and under wing-coverts white; feet and bill black. Wing 1·0; tail 1·1; bill, from forehead, 0·59; tarsus 1·5. The bill is not normal, being longer than the head.

This species is a representative form of *D. hypoleucum*, ex Basilan, which is black above and larger.

32. NECTAROPHILA JULIÆ, sp. nov.

[No. 402, ♂. No. 403, ♂. No. 404, ♀. } Eyes hazel. Were quite numerous on the island, generally about the tops of the high trees.]

♂. Forehead, entire head, and nape brilliant metallic coppery green; chin, throat, and upper breast brilliant metallic amethystine; space before the eyes black; cheeks and ear-coverts brown; lesser wing-coverts, uropygium, and upper tail-coverts brilliant metallic emerald-green; breast-feathers deep yellow, with orange-coloured tips; abdomen, vent, and under tail-coverts yellowish olive-green; under wing-coverts pale yellow and white; axillaries pale yellow; back and major wing-coverts and scapulars maroon-red; quills dark brown, externally margined with yellowish ruddy brown; rectrices black; bill and feet black. The second example has no orange edging to the pectoral feathers.

♀. Dull olive-green above, a narrow line passing from the base of bill over the eye pale yellow: chin, throat, abdomen, vent, and under tail-coverts pale yellow; breast the same, tinged with grey; minor wing-coverts olive-green, some tipped and centred with ruddy brown; quills dark brown, margined with ruddy brown; greater wing-coverts and scapulars ruddy brown, mixed with olive-green; inner edges of some of the quills margined with white; axillaries and under wing-coverts pale yellow and white; cheeks pale yellow; ear-coverts olive-green; rectrices black, middle pair narrowly, the others broadly tipped with white, outer pair for nearly half their length white; bill and feet black.

	Wing.	Tail.	Tarsus.	Bill, from gape.
♂	1·94	1·35	0·5	0·75
♀	1·87	1·25	0·5	0·62

A true *Nectarophila*.

33. ARACHNECTHRA JUGULARIS.

Certhia jugularis, Linn. S. N. i. p. 185. no. 7 (1766); Walden, *t. c.* p. 200. no. 123.

[No. 360, ♂. Ilo-ilo. Eyes black. Stomach had insects.
No. 389, ♂. } Camiguin.]
No. 390, ♂. }

These examples agree with those noted (*l. c.*). Not known hitherto from Camiguin.

34. CORVUS PHILIPPINUS.

Corvus philippinus, Bp. Compt. Rend. xxxvii. p. 830 (1853); Walden, *t. c.* p. 201. no. 125.

[No. 343, ♂. Zamboanga.
No. 356, ♂. Ilo-ilo. Eyes black. Stomach had seeds, worms, &c.

No. 382, ♀ } Camiguin. These birds have been seen at most of
No. 383, ♀ } the places we have been at; in the Philippines and on this island they were quite abundant.]

This species has not hitherto been known to inhabit the three islands above named. The four examples in the collection cannot be separated from those which inhabit Luzon, Negros, and Cujo; and, like them, their dimensions exceed those of the single type specimen of *C. brevipennis*, Schlegel, at Leyden. *C. philippinus*, however, is nothing but a slightly smaller form of *C. validus*, ex Sumatra, with a greenish rather than a bluish gloss on the under plumage. The following Table shows the principal dimensions of the species from six Philippine islands, together with those of typical examples of *C. validus*.

Corvus philippinus.

	Wing.	Tail.	Bill, from nostril.	Gonys.	Tarsus.
Luzon, ♀	11·50	8·25	1·50	1·00	2·25
Negros, ♂	12·25	8·75	1·75	1·00	2·35
—, ♀	12·13	8·67	1·67	1·00	2·35
Cujo, ♀	11·50	8·00	1·37	0·90	2·25
Camiguin, ♀	12·25	8·75	1·75	1·25	2·25
—, ♀	12·50	9·00	1·50	1·00	2·25
Ilo-ilo, ♂	11·75	8·85	1·62	1·12	2·20
Zamboanga, ♂	11·81	8·50	1·62	1·00	2·20
Corvus validus, ex Sumatra.					
Lampong	12·80	8·75	1·75	1·00	2·37
—	12·75	8·62	1·62	0·87	2·30

Corvus philippinus belongs to a small group of Crows differing but little from one another in tint, but separable by their dimensions, more especially that of the bills. *C. violaceus* is the smallest, then *C. enca*, *C. philippinus*, *C. validus*, and *C. validissimus*.

35. Calornis panayensis.

Muscicapa panayensis, Scop. Del. Fl. Faun. Insubr. ii. p. 96. no. 110 (1786); Walden, *t. c.* p. 205. no. 128.

[No. 384, ♂. No. 385, ♂. No. 386, ♂. } Camiguin. Eyes orange. Stomach had seeds.]

These examples do not differ from Luzon, Negros, and Zebu individuals. The locality is new.

36. Munia jagori.

Dermophrys jagori, Cab. J. für O. 1872, p. 316. no. 6; Walden, *t. c.* p. 207. no. 132.

[No. 339, ♂. No. 340, ♀. } Zamboanga.]

The two Mindanao examples do not appear to be in perfect dress. The rectrices of the female are tinged with ochre. New to Mindanao.

37. Osmotreron axillaris.

Treron axillaris, G. R. Gray; Bp. Compt. Rend. xxxix. p. 875 (1854); Walden, *t. c.* p. 211. no. 136.

[No. 346, ♀. Ilo-ilo. Eyes white; feet greenish. Stomach had fruit.]

New to Panay.

38. Phabotreron brevirostris, n. sp.

[No. 426, ♂. Pasnanaca. Eyes white; feet coral-red; bill black.]

♂. Forehead pale ruddy fulvous; vertex pale grey, passing over into amethystine on the occiput and nape; from the gape, passing below the eye, a black line, bordered underneath by a white line starting from below the eye and reaching to the nape; back of the neck emerald-green, becoming yellow-green lower down; some of the lowermost feathers being amethystine, then bluish green, terminated by yellow-green; others yellow-green, then amethystine, terminated with blue-green; back mixed amethystine and dull yellow-green; uropygium and upper tail-coverts dull yellow-green with scarcely any iridescence; wing-coverts the same, but tinged with amethystine; quills brown, edged with pale rufous or fulvous; tertiaries like wing-coverts, but without any iridescence; chin and throat pale ruddy fulvous like the forehead; remainder of under plumage ruddy fulvous, with an amethystine tinge on the breast and sides of neck; under tail-coverts pale French grey; under wing-coverts like abdomen, but deeper in shade; middle pair of rectrices pure amethystine, with a dark grey terminal band tinged with amethystine; remaining rectrices with a much broader terminal and pure grey band, the remaining part of each being deeply tinged with amethystine; outer pair with a broad, dark-brown subterminal band also washed with amethystine. Wing 4·75, tail 3·50, tarsus 0·75, bill from forehead 0·72.

This is a small representative form of *P. leucotis*, from which it

chiefly differs by its rufo-fulvous forehead, its pure amethystine rectrices, and its short bill.

39. MYRISTICIVORA BICOLOR.

Columba bicolor, Scop. Del. Fl. Faun. Insubr. ii. p. 94. no. 97 (1786); Walden, *t. c.* p. 217. no. 143.

[No. 395, ♂. } Malanipa. Eyes brown. These were abundant
No. 396, ♀. } on the island, but kept to the tops of the highest
No. 397, ♀. } trees.]

The two sexes are alike. The locality is new.

40. CHARADRIUS FULVUS.

Charadrius fulvus, Gm. S. N. i. p. 687. no. 18 (1788); Walden, *t. c.* p. 226. no. 159.

[No. 341, ♂. } Zamboanga.]
No. 342, ♀. }

For the first time recorded from Mindanao.

41. NUMENIUS PHÆOPUS.

Scolopax phæopus, Linn. S. N. i. p. 243. no. 4 (1766); Walden, *t. c.* p. 232. no. 181.

[No. 375, ♂. } Zebu. Eyes hazel. Stomach with shells.
No. 376, ♀. }
No. 401, ♂. Malanipa.]

A new locality.

42. TRINGOIDES HYPOLEUCOS.

Tringa hypoleucos, Linn. S. N. i. p. 250. no. 14 (1766); Walden, *t. c.* p. 234. no. 183.

[No. 391, ♀. Camiguin.
No. 435, ♂. Pasananca. Eyes hazel.]

This cosmopolitan species has not been hitherto made known as an inhabitant of either Camiguin or Mindanao.

43. TOTANUS INCANUS.

Scolopax incanus, Gm. S. N. i. p. 658 (1788).

[No. 405, ♂. Malanipa.]

For the first time recorded from any part of the archipelago. Pale ashy above; forehead and superciliaries, chin and throat pure white, clouded with grey on the breast and flanks. Wing 6·25. The dimensions of the wing in this species vary exceedingly. In an example (♂) from Fiji, No. 26 (*mus. nostr.*), the wing measures 7·20. Above it is dark ashy, and the grey on the breast is much deeper in tone. The Malanipa example was shot on January 30th.

44. GALLINAGO STENURA.

Scolopax stenura, Kuhl, MS.; *S. stenura*, Bp. An. St. Nat. 1829.

[No. 438, ♀. Zamboanga.]

Not hitherto recorded from any Philippine island.

45. RHYNCHÆA CAPENSIS.

Scolopax capensis, Linn. S. N. i. p. 246. no. 14 (1766); Walden, *t. c.* p. 235. no. 189.

[No. 437, ♂. Zamboanga. Eyes hazel.]

Known to inhabit the Philippines, but no exact locality hitherto recorded.

46. DEMIEGRETTA SACRA.

Ardea sacra, Gm. S. N. i. p. 640 (1788).

[No. 377, ♂. Zebu. Eyes orange.]

In ashy-blue plumage and in full breeding-dress.

For the first time noted as an inhabitant of a Philippine island.

47. LARUS RIDIBUNDUS.

Larus ridibundus, Linn. S. N. i. p. 225. no. 9 (1766); v. Martens, J. für O. 1866, p. 30.

Larus, sp., Walden, *t. c.* no. 206.

[No. 363, ♂. Manila.]

Dr. v. Martens's (*l. c.*) identification of the Manila specimens sent to Berlin by Jagor is thus confirmed.

48. STERNA BERGII.

Sterna bergii, Licht. Verz. d. Doubl. Berl. Mus. p. 80 (1823).

[No. 345, ♂. Zamboanga.]

New to the Philippines.

49. HYDROCHELIDON HYBRIDA.

Sterna hybrida, Pallas, Zoogr. Rosso-As. ii. p. 338. no. 395 (1831).

Hydrochelidon leucopareia, Natt.; Walden, *t. c.* p. 344. no. 207.

[No. 364, ♀. Manila.]

3. Reports on the Collection of Birds made during the Voyage of H.M.S. 'Challenger.'—No. III. "On the Birds of the Admiralty Islands." By P. L. SCLATER, M.A., Ph.D., F.R.S.

[Received June 15, 1877.]

"The 'Challenger' arrived at Nares Harbour, Admiralty Islands, on the 3rd of March 1875, and anchored to the lee of Wild Island about 6.30 P.M. She left again on the afternoon of March 10th." (*J. Murray*, MS.)

The Admiralty Islands lie in lat. 2° 18′ S., long. 146° 44′ E., to the north of New Guinea. Discovered by Le Maire and Schouten in 1616, or, according to other authorities, by Carteret in 1767, they are still very imperfectly known, and the 'Challenger' Naturalists were the first Europeans to visit them.

Nares Harbour lies on the north side of the principal island, "Admiralty Island," and is marked in the new Admiralty Chart of

the "Pacific Ocean," 1875. For some details of the 'Challenger's' visit, and remarks on the nature of the country, which appears to be densely wooded, Lieut. Campbell's 'Log-letters' (p. 259 *et seq.*) may be referred to.

The specimens of birds obtained during the sojourn of the 'Challenger' at Nares Harbour are 56 in number, and embrace examples of 27 species. Of these seven appear to be new to science.

	Specimens.	Species.	New species.
Passeres	17	7	4
Coccyges	2	1	
Psittaci	10	1	
Accipitres	2	2	
Herodiones	4	2	
Steganopodes	1	1	
Columbæ	8	2	2
Gallinæ	1	1	1
Ralli	1	1	
Limicolæ	7	6	
Gaviæ	3	3	
	56	27	7

1. RHIPIDURA SEMIRUBRA, sp. nov.

Supra læte castaneo-rubra; alis caudaque nigricantibus, secundariis extus et rectricibus ad basin rubris dorso concoloribus, his omnibus albo late terminatis, subtus alba, torque subgutturali et pectoris maculis quibusdam nigris; hypochondriis rufescentibus, crisso rufo; rostro nigricante, pedibus obscure cinereis: long. tota 5·5, *alæ* 2·8, *caudæ rotundatæ rectr. ext.* 2·8, *med.* 3·0.

Hab. Ins. Admiralitatis.

Obs. Species quoad formam *Rh. rufifronti* ex Australiâ similis, sed dorso toto castaneo diversa.

One "male" of this Flycatcher (No. 496), "insects in stomach."

2. MONARCHA INORNATUS, Garnot.

Muscicapa inornata, Garnot, Zool. Voy. Coq. i. p. 590, Atlas, t. 16. fig. 1.

Monarcha inornata, G. R. Gray, P. Z. S. 1858, p. 177.

Three skins (493, ♂; 494, ♂; and 495, ♀) of this species are in the collection. The sexes are alike.

"Eyes hazel: bill and feet indigo-blue."—*J. M.*

I have compared them with skins of this species collected by Wallace, in the British Museum. *M. fulviventris*, Hartlaub, P. Z. S. 1867, p. 830, of the Echiquier Islands, is nearly allied, if not identical.

3. MONARCHA INFELIX, sp. nov.

Supra nigerrimus, tectricibus alarum minoribus et capitis pone oculum et cervicis lateribus albis; subtus albus, gula et pectore toto cum faciei ante oculos lateribus nigerrimis; caudæ rectricibus

lateralibus albis, mediis ad basin et ad apicem nigris; subalaribus albis; rostro et pedibus nigris: long. tota 5·8, *alæ* 3·2, *caudæ* 2·8, *rem. quarto et quinto æqualibus et longissimis.*

Hab. Ins. Admiralitatis.

Obs. Species formâ et habitu, ut videtur, *M. loricati*, sed pectore nigro et alarum tectricibus albis distinguenda.

A single specimen of this species (no. 497) was "shot on the main Island;" insects in stomach. Unfortunately it is in a very imperfect state, the bill and greater part of the tail-feathers having been shot away. It is *possible* that the two centre tail-feathers, which are apparently absent, may be wholly black as in *M. loricatus*; the three outer ones are wholly white.

4. PHILEMON ALBITORQUES, sp. nov.

Supra obscure fuscus, plumis subtus cinereis; alis caudaque nigricantioribus; fascia cervicis postica et toto corpore subtus albis cineraceo adumbratis; capitis plumis brevibus, rigidiusculis, fronte loris et oculorum ambitu fere denudatis; subalaribus cum ventre concoloribus; rostro nigricanti-corneo, mandibula inferiore ad basin flava; pedibus obscure cinereis: long. tota 13·5, *alæ* 7·3, *caudæ rectr. lat.* 4·2, *med.* 5·5, *tarsi* 2·0.

Hab. Ins. Admiralitatis.

Obs. Species torque colli postico insignis, rostro ad basin paulum incrassato et tumido, pedibus robustis.

A single example of this fine Honeyeater (no. 481) was "shot on Wild Island."

"Female: eyes brown; feet grey; bill dark, base of the lower mandible yellow: stomach had grasshoppers.

"This bird made a noise like the 'Leather-head'[1] of Australia, but much louder."—*J. M.*

The specimen is moulting, both new wing- and tail-feathers being not fully developed. The breast is slightly stained with yellow, as is often the case with the Meliphagidæ.

5. NECTARINIA FRENATA, Müller.

Four examples (487, male; 488, male; 489, female; and 490, female) of this rather widely spread Sun-bird (see remarks as to range, P. Z. S. 1877, p. 104). Mr. Murray notes, "eyes hazel." None of the specimens are in full dress.

6. MYZOMELA PAMMELÆNA, sp. nov.

Nigerrima, remigum marginibus internis cineraceo-albidis, rostro et pedibus nigris: long. tota 5·0, *alæ* 2·7, *caudæ* 2·0.

Hab. Ins. Admiralitatis.

Obs. Affinis *M. nigritæ*, sed crassitie majore, rostro longiore et subalaribus nigris diversa.

Two specimens of this apparently new *Myzomela* (491, 492) are in the collection. The one described (491) is marked "male, eyes hazel," and is evidently adult. In the other (492), apparently young,

[1] I. e. *Philemon* (sive *Tropidorhynchus*) *corniculatus.*

the plumage is mixed with cinereous, the feet not so dark, and the under surface of the wings more white. But the size alone is sufficient to distinguish it from its Papuan representative.

7. Calornis, sp. inc.[1]

463, male; 464, male; 465, male; 466, female; 467, female.

"Eyes orange: stomachs contained seeds and grubs.

"This was, perhaps, the commonest bird at the Admiralty Islands."—*J. M.*

Lord Tweeddale, who has kindly examined these skins for me, writes as follows:—"Nos. 463–466. The purple reflexions being restricted to the head, chin, and throat distinguishes these examples from all others known to me. They may belong to either *C. viridescens*, Gray, *C. gularis*, Gray, or *C. amboinensis*, Gray; for I do not possess typical examples, but I believe that all these are little more than stages of *C. metallica*. If they do not fall under either of these three titles, I think they may be safely described and named; for their distinctive characters are well marked.

"No. 467. This belongs to a distinct species, very close to *C. cantoroides*, Gray."

The question of the different subspecies of *Calornis*, which has been ably treated of by Lord Tweeddale and Mr. Sharpe, is one that, in the absence of a large series for comparison, I should fear to venture on. As regards specimen no. 467, there may perhaps have been an error in the label, and the bird may have been obtained elsewhere.

8. Halcyon saurophaga, Gould.

Two examples (498, 499), agreeing with other specimens of this species in every respect. "Shot on D'Entrecasteau Island, one by Capt. Thomson. Eyes brown; bill and feet dark; base of lower mandible flesh-coloured or white."—*J. M.*

9. Trichoglossus cyanogrammus, Wagler; Finsch, Papag. ii. p. 830.

Ten skins of this fine species (449–456, males; and 457, 458, females) are in the collection. The breast is of a brighter red than in an example of the same bird from Humboldt Bay, New Guinea, and the purplish edgings of the breast-feathers are wider. There is also more brown on the nape in some of the skins.

"Eyes orange; bill and feet black: seeds generally in stomachs."—*J. M.*

10. Haliaetus leucogaster, Gm.; Sharpe, Cat. i. p. 307.

"Female (no. 478, from Maclear Island): eyes brown; cere black; bill horn-colour; claws black; legs flesh-colour: in stomach a Starling (*Calornis*?) and remains of a Tern."—J. M.

11. Pandion haliaetus.

"Male (no. 479) shot on D'Entrecasteau Island: stomach had fish."—*J. M.*

[1] *Cf.* Walden, Trans. Zool. Soc. viii. p. 79, et Sharpe, Ibis, 1876, p. 46.

12. Fregata ariel (Gould).

"No. 482, male: eyes black, flesh of throat red: fish in stomach. Shot from the pinnace, while hovering with others over a shoal of fish."—*J. M.*

13. Nycticorax caledonicus, Lath.; Gould, B. Austr. vi. pl. 63.

Three specimens of this Night-heron, two adult (474, male; 475, female) and one in young plumage (476), were shot on Pigeon Island.

14. Ardea sacra, Gm.; Finsch & Hartl. Orn. Central-Polyn. p. 201.

A specimen (no. 480) in grey plumage, with a few white feathers on the throat; "eyes yellow; legs had a yellowish tinge; bill black."—*J. M.*

15. Carpophaga rhodinolæma, sp. nov.

Supra æneo-viridis, alis caudaque saturatioribus, remigibus et rectricibus intus nigricantibus; capite et cervice totis et corpore inferiore canis; genis gulaque rosaceo indutis; crisso obscure castaneo; mento et oculorum ambitu anguste albis; rostro nigro, pedibus rubris: long. tota 12·6; *alæ* 9·3, *caudæ* 5·6.

Hab. Ins. Admiralitatis.

Four examples of this Fruit-Pigeon (nos. 468, 469, 470, males; 471, female) belonging to the group of *C. ænea* are in the collection.

The Marquis of Tweeddale, who has kindly compared the birds for me with his series, writes:—

"Apart from its dimensions, this *Carpophaga*, from the Admiralty Islands, only differs from individuals of *C. ænea*, ex Ceylon, Malabar, Central India, Burma, the Andamans, Borneo, Java, the Philippines, and Hainan, in having no rosy or vinous tint on the grey part of the plumage, excepting on that of the throat, cheeks, and ear-coverts. In example no. 468 this is very well marked.

"The outer webs of the primaries are not conspicuously powdered with grey as is the case in Central-Indian, Burman, Javan, Bornean, Hainan, and Philippine examples. But I do not attach much importance to this difference at present; for I suspect this powdering comes on only when the quills are old, and indications are evident on some of the quills of no. 468."

Mr. Murray writes:—

"These birds were in immense numbers, but more especially on a small island near the mainland, hence called 'Pigeon Island.' On the first day four guns bagged 85 in two hours. Another day 230 were taken, another 200, another 150. Three eggs were got. This island was about two acres in extent. The Pigeons always returned to it from the mainland, however much they were disturbed. It would seem to have been their breeding-place."—*J. M.*

16. PTILOPUS JOHANNIS, sp. nov.

Clare psittaceo-viridis, maculis scapularium paucis obscure cæruleis; fascia pectoris semilunari lata, ventre imo et crisso lætissime flavis; pileo et ventre medio pulcherrime lilacinis; remigibus et rectricibus subtus dilute plumbeis, harum vitta apicali dilutiore, fere albicante; rostro nigro, pedibus obscure rubris: long. tota 7·5, alæ 4·7, caudæ 2·5.

Fem. *viridis, fere unicolor, ventre medio et crisso flavis.*

Hab. Ins. Admiralitatis.

Obs. Species affinis *Pt. bello* et *Pt. specioso*, sed colore pilei et ventris lilacino distincta.

Of this splendid little Fruit-Pigeon, which I have great pleasure in naming after Mr. John Murray, three males (459, 460, 461) and one female (462) were "shot on Wild and D'Entrecasteaux Islands."

"Eyes of males light yellow, of females white; feet light red or pink colour; tip of bill light green."—*J. M.*

17. MEGAPODIUS RUBRIFRONS, sp. nov.

Supra olivaceo-brunneus, dorso superiore et corpore subtus nigricanti-plumbeis; ventre imo obscuriore; capitis plumis brevibus, rigidiusculis, fusco-nigris, in genis et gutture parce sparsis et cutem rubram ostendentibus; pilei parte anteriore fere omnino denudata rubra; rostro flavo, ad basin nigricante; pedibus (in pelle) fere nigris: long. tota 11·0, alæ 8·5, caudæ 3·0, tarsi 2·4, rostri a rictu 1·4.

Hab. Ins. Admiralitatis.

Obs. Species fronte denudatâ rubrâ insignis, *M. eremitæ* (Hartl. P. Z. S. 1867, p. 830) affinis, sed pedibus obscuris.

There is a single skin of this species, "no. 472, male: eyes brown, bill yellowish, feet and legs dark horn-colour: stomach contained straw-material."—*J. M.*

There is a second specimen in spirits. Both were shot on Pigeon Island.

18. PORPHYRIO INDICUS, Horsf.; Walden, Trans. Zool. Soc. viii. p. 92.

A single "male" specimen (no. 473) apparently of this wide-ranging species was "shot on Pigeon Island by Mr. Buchanan, who says it was sitting on a tree. Stomach had seeds: eyes red; bill red; legs dull red."—*J. M.*

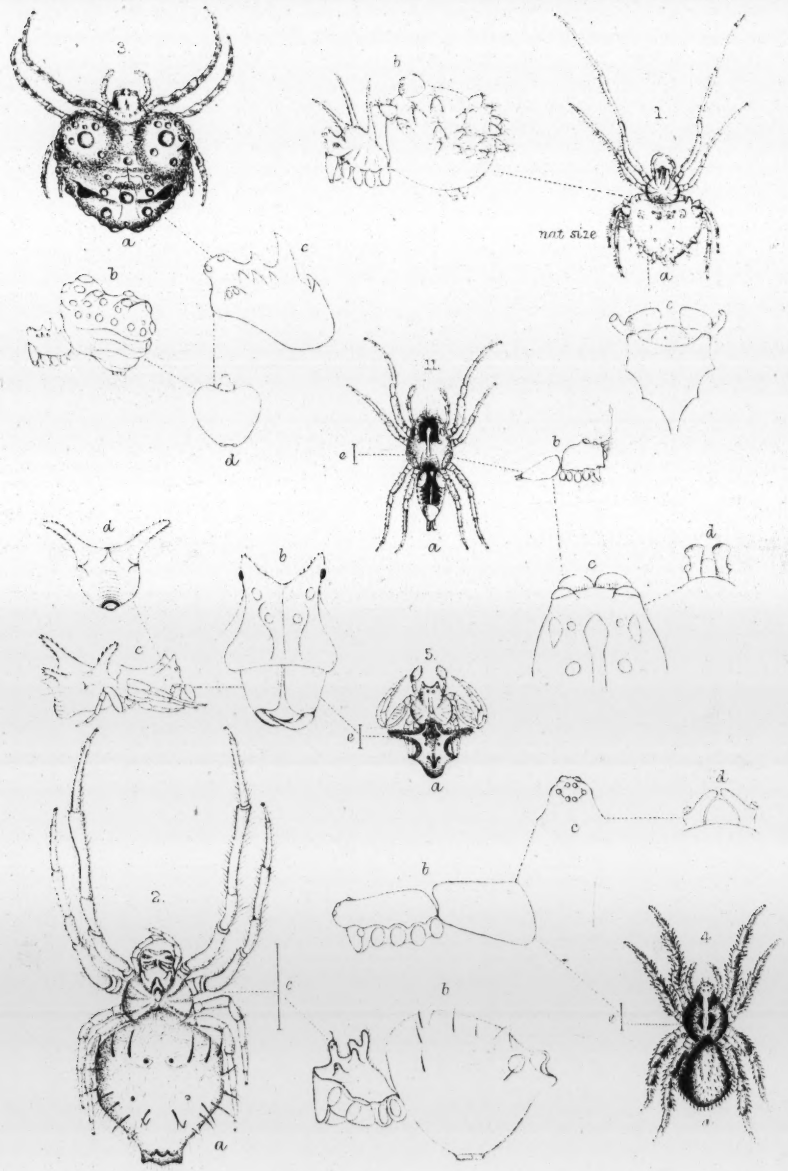
19. ESACUS MAGNIROSTRIS (Temm.); Gould, B. Austr. vol. vi. pl. vi.

One specimen (no. 477, female), "shot on Pigeon Island: eyes yellow; bill black: stomach had shells: legs and base of the bill yellow."

20. CHARADRIUS MONGOLICUS, Pallas; Harting, Ibis, 1870, p. 384.

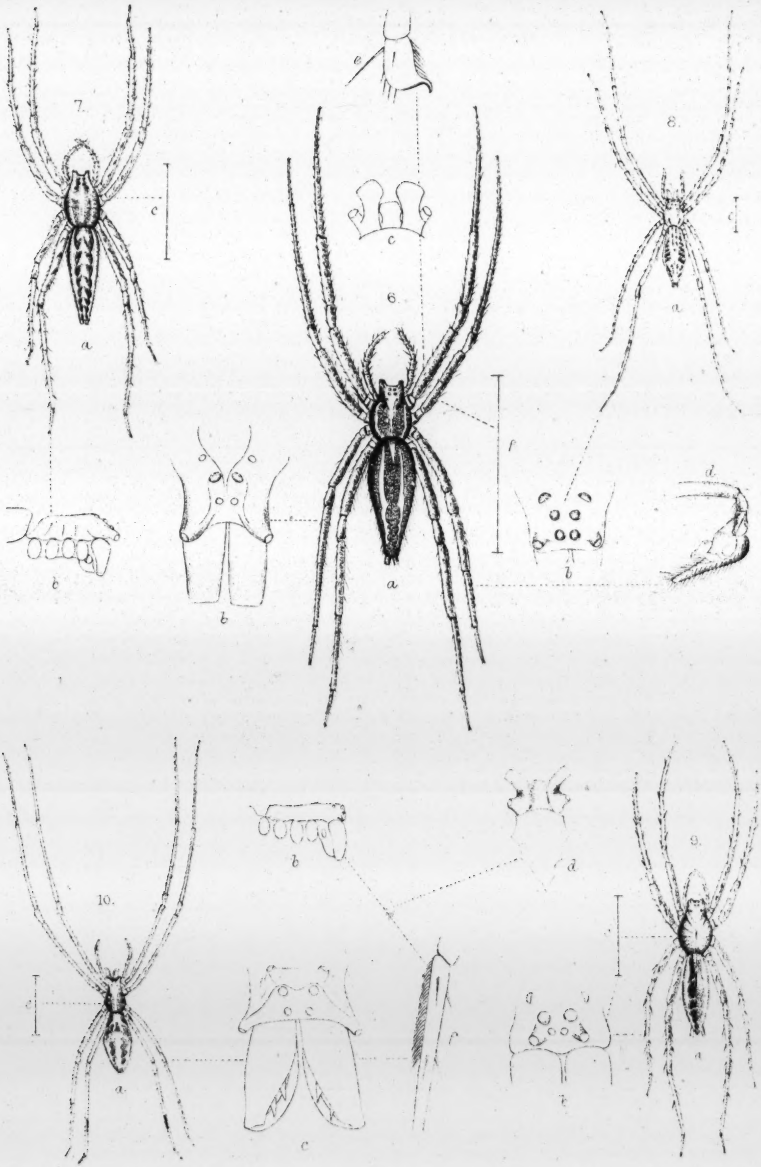
One example (no. 504), "female: eyes black; bill, legs, and feet black."—*J. M.*

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NEW GENERA AND SPECIES OF ARANEIDEA.





C.F.Cambridge del. F.Carter lith.

NEW GENERA AND SPECIES OF ARANEIDEA

21. STREPSILAS INTERPRES.

Two specimens (nos. 500, 501, males) were obtained on the main island. "Stomachs had pieces of shell," &c.—*J. M.*

22. NUMENIUS UROPYGIALIS, Gould.

One skin (483), "female."

23. TOTANUS INCANUS, Gm.

Actitis incana, Finsch et Hartl. Orn. Central-Polyn. p. 182.

One example (502), "female: eyes brown, legs green, bill dark."—*J. M.*

24. TRINGOIDES HYPOLEUCOS (Linn.).

One specimen, a female, no. 503 of MS. Cat.

25. ANOUS STOLIDUS (Linn.).

A female (no. 485): "eyes black.

"This Tern was most abundant here, and could always be seen in immense numbers, feeding on the shoals of fishes."—*J. M.*

26. ANOUS MELANOGENYS, Gray; Saunders, P. Z. S. 1876, p. 670.

One "female" (no. 485): "eyes black." Mr. Howard Saunders has kindly determined the Laridæ for me.

27. STERNA BERGII, Licht.

One skin (no. 486): "eyes black."

4. On some new Species of Araneidea, with Characters of two new Genera, and some Remarks on the Families Podopthalmides and Dinopides. By the REV. O. P. CAMBRIDGE, M.A., C.M.Z.S., &c.

[Received May 30, 1877.]

(Plates LVI. & LVII.)

The twelve Spiders included in the following descriptions belong to six widely separated families, and are inhabitants of localities very distant from each other, comprising Australia, India, Ceylon, the west coast of Africa, the island of Samoa, and Brazil.

Of the first family (Gasteracanthides) there are three species, which I have, for the present at least, included in the genus *Cyrtarachne*, Thor., though two of them, one from the river Coanza, and the other from Rockhampton, are very abnormal species, and may perhaps eventually form the types of one, if not of two new genera.

In the next family (Cryptothelides) the Spider described is from Ceylon,—*Cryptothele ceylonica*; it is remarkable, not only from its own special and very peculiar characters, but because it is as yet

only the second species known, either of the genus or family, which were lately founded by Dr. Ludwig Koch upon an Australian Spider. The present species is thus another instance of a Spider peculiar (so far as our present knowledge goes) to Ceylon and Australia. Previous instances have been furnished in the genera *Amycle* and *Miagrammopes*.

Of the third family (Eripides) little is known. Two species only besides the present, have been described; and all of them are from Brazil, the present being the first recorded example of the male sex. The close affinity between the Eripides and Stephanopides has not yet received sufficient attention. The latter family is (as at present known) exclusively from Australia and New Zealand, while the former is South-American.

The family Podophthalmides, which is the next contained in this paper, is one of which one (West-African) species only has before been named. Dr. Ludwig Koch, indeed, describes a second species from the river Anseba, E. Africa; but, being doubtful as to its distinctness, he has given it no name. The genus *Podophthalma* (Capello) is an instance of the difficulty, in some cases, of assigning a systematic place to a Spider. Dr. L. Koch, 'Ægyptische und Abyssinische Arachniden,' p. 36, would place this genus in the family Agelenides; M. Simon thinks that it belongs, "without any doubt whatever," to the family Oxyopides, while to myself it appears necessary to constitute the type species (with those here described) and the genus *Ocyale* (Sav.) a distinct family next to the Lycosides. That there is some affinity with the Agelenides, I have myself observed (see *infrà*, p. 566, the remarks there made having been written before those of Dr. L. Koch had come under my notice).

Of the five species of *Podophthalma* described below, one is from East-Central India, another from the river Coanza, two from Madagascar, and one from Brazil. Two of these, *P. incerta* and *P. diversa*, undoubtedly show characters which give some support to Dr. L. Koch's view of their systematic position; and these may perhaps have to be separated under another generic appellation, and be removed to the Agelenides; but how far the typical species of *Podophthalma* would necessarily follow them, should they be so removed, is not so clear to me at present.

The fifth family, Dinopides, including the genus *Avella* described below, contains now three genera and is an exceedingly remarkable group; and I confess that its systematic position is, as yet, a puzzle to me. Walckenaer, as well as Macleay, who founded it, placed *Dinopis* in the family Lycosides, between which and the Salticides I have at present left it, though that place will probably not long retain it. I cannot, however, agree with Dr. L. Koch, who places *Dinopis* in the family Eresides (*vide infrà*, p. 573); I would rather suggest that its place is nearer to the Agelenides, though in the absence of any knowledge of its habits it is impossible to speak with certainty upon this point.

The new Salticid genus *Athamas*, the last Spider here described,

adds another to the numerous generic, or subgeneric, forms of the genus *Salticus*, Latreille. It has a close affinity to *Lyssomanes*, Hentz; but its differences from that, as well as from another allied genus, *Jelskia*, Tacz., appear to me to warrant its being made the type of a separate group.

Fam. GASTERACANTHIDES.

Gen. CYRTARACHNE, Thor.

CYRTARACHNE LONGIPES, sp. n. (Plate LVI. fig. 1.)

Adult female, length nearly 7 lines.

It is with great hesitation that I include the present West-African Spider in the genus *Cyrtarachne*, differing, as it does, from the typical species in the greater length and slenderness of the first and second pairs of legs, as well as in the higher eye-eminences. The form, however, of the maxillæ and labium is similar; and as the three long and remarkable spines on the cephalothorax are represented in some (if not in all) of the typical Australian species of *Cyrtarachne*, I have thought it best to place it provisionally with them until perhaps other species from West Africa may prove it to belong to a group specially characterized by the peculiarities noted, and so to require a separate genus for their reception.

The *cephalothorax* of this Spider is broad and rounded behind, much narrower in front, and strongly constricted laterally at the caput. The occipital region is gibbous and has three long, strong, pointed, tapering, nearly erect spines in a line along the middle. These spines are almost straight, but rather divergent; the central one is the longest, and the anterior the shortest. Its colour is yellow strongly tinged with brownish orange on the caput, and covered with a fine, silky, whitish pubescence. The three spines are also similarly clothed; and their basal portion is similar to the caput in colour, their upper part being of a deep blackish red-brown.

The *eyes* are very small, and of an amber-colour; they are seated on three strong, somewhat tuberculiform eminences placed in a transverse line at the fore part of the caput. The central eminence (which is much the largest and highest) has four eyes near its summit, in the form of a quadrangle, whose transverse is rather longer than its longitudinal diameter; the two posterior eyes of these four are the largest of the eight. The eyes of each lateral pair are placed contiguous to each other near the upper extremity, on the outer sides of the lateral eminences.

The *legs* are rather slender, and differ considerably in length; those of the first pair are much the longest; next to them are those of the second pair; and the third pair are a good deal the shortest. They are of a dull yellow colour, the femora tinged with orange, and (excepting these joints) unequally annulated with dull reddish brown; they are also furnished with numerous long, prominent, fine, silky, whitish hairs, but no spines; and each tarsus terminates with three rather sharply bent claws, the two superior ones pectinated at their base. The tibiæ are gradually enlarged at their anterior extremities.

The *palpi* are short, and similar to the legs in colour and clothing.

The *falces* are tolerably long and strong, subconical, straight, perpendicular, and of a yellow-brown colour.

The *maxillæ* are moderate in size and strength, broad and rather rounded at their extremities, much bent downwards and backwards, and inclined towards the labium. They are of a rather orange yellow-brown colour, the extremities being pale yellow.

The *labium* is small, short, and of a semicircular form; its colour is yellow-brown, and the apex pale yellow.

The *sternum* is heart-shaped, hollowed at its fore extremity, and of a pale orange yellow-brown colour.

The *abdomen* is large, very convex above, of a short broad heart-shape when seen from above, and hollowed at the middle of its fore extremity on the upperside. Its cuticle is of a semicorneous nature; and besides numerous blunt, conical, various-sized, but smaller tubercles (principally on the sides and hinder part), there is a large, circular, shining, glossy one on each of the fore corners (or rather shoulders) of the abdomen. These large round tubercles are of a yellow-brown colour, rather brighter in hue than the rest of the abdomen, the underside of the latter being the palest.

The tubercles on the sides and hinder part are symmetrically placed; and four form a curved transverse line with the two large circular ones. On the middle of the upperside are six, not very large, round, sigilliform spots or markings, in two longitudinal lines of three each. The sides and underside have numerous, small, somewhat similar, impressed spots, connected with each other by pale brown venose streaks. The whole of the abdomen, excepting the two circular tubercles, is dotted with fine silky hairs; those at the extremities of the conical tubercles form a tuft, apparently connected for a little distance from their bases and then spreading out in all directions, giving the abdomen a very peculiar and characteristic appearance. The spinners are short, tolerably strong, and two-jointed, those of the inferior pair being much the strongest. The genital aperture is very small and inconspicuous.

A single example of this very remarkable Spider was received from the banks of the river Coanza, in West Africa, where it was found in 1873 by Mr. Henry Rogers, of Freshwater, Isle of Wight.

CYRTARACHNE FURCATA, sp. n. (Plate LVI. fig. 2.)

Adult female, length 6 lines.

Length of the example described (an immature female) nearly $4\frac{1}{2}$ lines.

The *cephalothorax* of this Spider resembles that of *C. longipes* in the elevated prominences on which the central and two lateral pairs of eyes are traced, but differs in the much more prominent clypeus. There is also on the occiput a strong, furcate, somewhat spiniform eminence, the height of which is a little greater than that of the central ocular eminence; the prongs of this occipital eminence are blunt-pointed, and range in a line with the central ocular one; also in a line between the occipital one and each of those bearing

the lateral pairs of eyes is another, shorter, erect, rather slender, blunt-pointed, somewhat nipple-like eminence. The lower fore corners of the clypeus are prominent. The colour of the cephalothorax is pale whitish straw-colour, marked and clouded in a somewhat radiated form, on the sides, with brownish yellow; it is clothed with longish, pale, slender hairs; and from the middle of the summit of the central ocular eminence issue two longish, black, curved and almost contiguous black bristles.

The *eyes* are small; those of the central group (four in number) form a square on the front of the upper extremity of the middle eminence; those of each lateral pair are contiguous to each other on the outer side of the summit of the lateral eminences, and are widely removed from the middle group.

The *legs* are neither very long nor strong; those of the first and second pairs differ but little in length, though perhaps the second pair are slightly the longest, and the third pair are the shortest. They are of a straw-yellow colour, semiannulated with brown, and clothed with longish fine hairs.

The *palpi* are similar in colour to the legs, and have a single curved pectinated claw at their extremity.

The *falces* are moderately long and strong, perpendicular, and similar in colour to the palpi.

The *maxillæ* and *labium* are like those of *A. trispinosa* in form, and are similar to the legs in colour.

The *sternum* is of a somewhat triangular shape; it is of a yellowish colour, clouded with brownish in the middle, and marked with a black spot opposite to the basal joints of the second, third, and fourth pairs of legs.

The *abdomen* is large, very short, subtriangular, or somewhat heart-shaped, extremely convex above, and projects considerably over the base of the cephalothorax. On the upperside are some not very large, bluntish, conical protuberances; two of them are in a straight transverse line, wide apart towards the fore margins; the rest, eight in number, are arranged in a somewhat circular group at the posterior extremity. The upperside is of a dull sooty hue, mapped out into rather roundish-angled patches of various forms and sizes, which are divided from each other by clear and intersecting straw-yellow stripes; most of these patches have a central blackish spot on the fore part; and from each of the three immediately in front of each of the two foremost conical protuberances rises a long, erect, somewhat lanceolate black bristle, there being also several others of the same kind on the sides and hinder part; the patches above described are almost obsolete on the middle and hinder part of the upperside, which are then of a plain straw-yellow colour. The underside is suffused with yellow-brown; the hinder slope (*i. e.* the part between the protuberances at the hinder extremity and the spinners) and sides are streaked vertically with pale yellow-brown lines.

An adult female of this Spider was received from Paramatta (Australia), where it was found by Mr. Barlow, and sent to me by my kind friend Mr. Frederick Bond several years ago. I have also very

lately received an immature female from Rockhampton, N. S. W., through Mr. E. Janson.

CYRTARACHNE HOBSONI, sp. n. (Plate LVI. fig. 3.)

Adult female, length 5¼ lines.

The *cephalothorax* of this Spider is of the same general form as that of *C. longipes*; but the prominence on which the four central eyes are placed is much less projecting, and the spines are much shorter; besides the three in the central longitudinal line (of which the middle one is much the longest and strongest, the other two being very short), there are two or three other short ones on each side in an oblique line, between the long central spine and the lateral eyes. The colour of the cephalothorax is dark yellowish brown, thinly clothed with hairs, and rather paler on the fore part of the caput.

The *eyes* of the central group form a square, those of the posterior pair being rather larger than the anterior ones; those of each lateral pair are close together on a prominence, and very small, but widely removed from the central group.

The *legs* are short and rather slender; there is very little, if any, difference in length between those of the first and second pairs, those of the third pair being the shortest; they are of a brownish yellow colour, annulated, but not very distinctly, with darker yellow-brown; the femora are palest, but most distinctly annulated; the legs are destitute of spines, being furnished with hairs only.

The *palpi* are short, slender, and similar to the legs in colours and armature.

The *falces* are moderately long and strong, and perpendicular, and of a dark yellow-brown colour.

The *maxillæ* and *labium* exactly resemble those of *A. trispinosa* in form, and are of the same colour as the falces.

The *sternum* is of a triangular form, its fore side hollowed, and its colour yellow-brown.

The *abdomen* is of great size, of a corneous nature, and appears to overwhelm the cephalothorax; it is of a short heart-shape, its shoulder-portions, as well as the posterior extremity, being large, prominent and rounded, and, together with the sides, studded with round, raised, dark red-brown bosses or protuberances of various sizes; the two largest of these are placed one on each of the summits of the shoulder-portions; the three next in size form a triangle on the hinder portion; the sides are deeply rugulose; the ground-colour of the upperside is a lightish yellow-brown; in the hollow centre of the fore side is a large, yellow, somewhat irregularly formed patch, with an irregular black marking on each shoulder-part, and two other longer ones, one on each side, near the hinder portion. The underside is darker than the upper, its lateral portions marked strongly but irregularly with connected brown streaks.

The example from which the above description has been made was received from Bombay, where it was found, and kindly sent to me, by Major Julian Hobson. Three other examples, similar to the one

described, excepting in being much smaller, have more recently been sent to me from Ceylon by Mr. G. H. K. Thwaites.

Fam. Cryptothelides.

Gen. Cryptothele, L. Koch.

Cryptothele ceylonica, sp. n. (Plate LVI. fig. 4.)

Adult female, length 1¾ line.

Cephalothorax oval behind, but constricted laterally at the caput; it is generally flattened, and its sides much depressed; its upper surface is roughened and clothed with coarse bent bristles and hairs; these are mainly disposed in two curved lines along the middle, enclosing the thoracic junction in an elongated oval figure. The colour of the cephalothorax is a uniform yellowish brown; and the height of the clypeus (which retreats considerably) is just equal to the length of the falces.

The *eyes* are seated on black spots in three transverse rows—2, 2, 4, at the slightly produced upper extremity of the caput. Those of the foremost row are of tolerable size and the largest of the eight; these are separated by an interval of an eye's diameter; those of the middle row are next in size, and are contiguous to each other; this row is separated from the first by about the diameter of one of the eyes of the foremost row. The hinder row is curved, the convexity of the curve directed backwards; its eyes (four in number) are of about equal size, but much smaller than the rest; those of the central pair of this row are separated by an interval of an eye's diameter, and form a line scarcely differing in length from that of the middle row; the hind laterals are each separated from the hind central next to it by an interval of about double the length of that which divides the central pair from each other, and equal to that which separates these last from those of the middle row.

The *legs* are short, strong, and differ but little in length; those of the fourth pair are slightly the longest; and the difference between those of the second and third pairs is very little, the third pair being perhaps the shortest. They are similar to the cephalothorax in colour; and the several joints (at least the tibiæ, genua, and femora) are of a gouty or somewhat nodose form, and furnished with coarse tuberculose spines, curved spine-like bristles of uniform thickness throughout their length, and hairs; each tarsus ends with three claws. Some portions of the legs appeared to be darker than the rest; but this was caused, I think, by extraneous matter clogged up among the bristles.

The *palpi* are short, similar to the legs in colour, and furnished with short, coarse bristles and hairs.

The *falces* are short, not very strong, subconical, considerably directed backwards, and a little paler in colour than the cephalothorax.

The *maxillæ* are short, and rather weak, slightly curved, and much inclined towards the labium, over which they fit closely, with their extremities almost meeting; their colour is like that of the falces.

The *labium* is similar in colour to the maxillæ; and is of a somewhat subtriangular form, rounded at the apex; it is large in comparison with the size of the maxillæ, its apex reaching very nearly to their extremities.

The *sternum* is large, heart-shaped, truncated at its anterior extremity, of a yellowish colour, and clothed thinly with coarse hairs.

The *abdomen* is short, broadest and rounded at its hinder extremity. This part is prolonged into a kind of flap which bends downwards and underneath, so as totally to conceal the spinners, whose number and form consequently could not be discerned. According to Dr. L. Koch (Die Arachn. Austr.) the spinners of this genus are two in number. The colour of the abdomen is of a darker hue than the cephalothorax; its whole surface is rugulose and clothed with coarse, bent, spiny bristles and hairs. The example described was much disfigured by extraneous substances, dirt and dust, accumulated and retained by its peculiar curved bristly armature.

A single example of this remarkable Spider was received some time since from Ceylon, where it was found, and kindly forwarded to me among many other Spiders, by Mr. G. H. K. Thwaites.

The type of this genus is Australian; and its close affinity to *Stephanopis* (Cambr.) is very evident. The discovery of a second species, so nearly allied to the Australian one, gives another proof of a similarity between the Ceylon and Australian Arachnids. Two other forms common to these two regions are the remarkable genera *Amycle*, Cambr., and *Miagrammopes*, id. Although nearly allied to *Cryptothele verrucosa*, L. Koch, the present Spider may be easily distinguished by a great difference in the relative size and position of the eyes.

Fam. Eripides.

Gen. Eripus, Walck.

Eripus quinquegibbosus, sp. n. (Plate LVI. fig. 5.)

The *cephalothorax* is broad and round behind, and much constricted laterally at the caput; this latter part is elevated at its fore part into two considerable conical divergent eminences, and has a third eminence of a rather stronger and blunter form at the occiput. The surface of the cephalothorax is granulose; the caput is of a reddish orange-yellow brown, suffused more or less on the sides with dark red-brown, in which colour it joins with the line of the thoracic region; the summit of the occipital eminence, as well as a stripe running from it forwards, is bright yellow; and the facies has three dark-brown perpendicular streaks; the outer ones are somewhat sinuous, the middle one straight; the three eminences are furnished with short bristly hairs.

The *eyes* are in three transverse rows, 2, 2, 4; the lower or foremost row is the shortest; and the hinder one is curved, the convexity of the curve being directed backwards. Those of the first row are amber-coloured, and divided by rather over two diameters' interval; those of the next row are larger, and are placed in front of the base of the two conical eminences on the caput, being separated by an

interval of double the extent of that between the eyes of the first row, and their colour is black, with a narrow orange margin; the laterals of the hinder row are placed rather behind, and near the summit of the eminence, and are divided from those of the second row by an interval equal to that between the second and first rows; the two centrals of the hinder row are seated behind the bases of the eminences, and are considerably further apart than each is from the lateral, of the same row, on its side.

The lateral eyes of the three rows form on each side a very nearly straight line; and its length is rather greater than the height of the clypeus.

The *legs* are strong; those of the first and second pairs are much the longest, the difference in their length being very slight; the first are perhaps a little the longest, and the third pair shortest. They are of a yellow colour, clouded with orange and brown in parts, and the two basal joints are bright red-brown. The femora, tibiæ, and metatarsi of the first two pairs are furnished with spines; those on the femora are in front; those on the other two joints are underneath. Each tarsus terminates with two curved claws, furnished beneath the basal portion with, apparently, no more than 1–3 denticulations.

The *palpi* are short and rather strong; the radial joint is shorter than the cubital, but less stout, and has its fore extremity on the outer side produced into a furcate projection; the upper prong forms a short, curved, pointed, claw-like apophysis; the under one adheres close to the outer side of the digital joint, and is of a flattened form, pointed at the end, and much longer and larger than the upper prong; the digital joint is large, of a broad oval form, of a brownish yellow colour, the rest of the palpus being yellow; the palpal organs are simple in structure, and apparently inscribed by a filiform spine.

The *falces* are short, strong, subconical, perpendicular, and of a deep yellowish-red colour.

The *maxillæ* are moderate in length and strength, straight, but rather inclined towards the labium, and a little the broadest at their extremities, their colour being reddish yellow-brown, palest at the extremities.

The *labium* is of the same colour as the maxillæ; its breadth and height are about equal; but its base is broader than its apex, which is rounded.

The *sternum* is heart-shaped, of an orange-yellow colour, margined with dark red-brown.

The *abdomen* is broadest and most convex at the hinder extremity; the hinder part, sides, and underside are rugulose; and the whole surface is covered with small, red-brown, shining tubercles; on the upperside are two long, slightly tapering, strongly divergent prominences; and at the middle of the upper part of the hinder extremity is another, shorter and more sharply pointed; a little lower down on each side of the hinder extremity is another still shorter, or simply conical eminence: the upperside of the abdomen, including the eminences, is of an orange-yellow colour; the two anterior eminences have each two longitudinal red-brown stripes, the foremost of which

reaches to the fore margin of the abdomen; each of the other eminences has a single, less distinct, stripe of a similar colour; and on the fore half of the upperside of the abdomen is a central longitudinally brown marking which is produced at its hinder end until it meets the stripe on the third eminence; four red-brown impressed spots form a square (whose fore side is the shortest) about the middle of the upperside. The sides and underparts are yellow-brown; the spinners are short, compact, and encircled at their base by a yellow-brown corneous-looking fillet or rim. A large round area at the fore part of the underside, including the spiracular plates and the junctional pedicle, are of a coriaceous texture and bright red-brown colour.

A single example of this distinct and remarkable Spider was contained in a collection made for me in Minas Geraes in 1871, by Mr. Henry Rogers. So far as I know, this is the first male of the genus yet described. The genus, indeed, which is closely allied to *Stephanopis* (Cambr.), consists at present of but three species, *E. heterogaster*, Latr., *E. spinipes*, Bl., and *E. quinquegibbosa*, all being found in Brazil. The present species cannot be confounded with either of the other two, not only differing in the number of the abdominal prominences, but in their form and colour also: these prominences are three in *E. spinipes*, five in *E. quinquegibbosa*, and seven in *E. heterogaster*, the last being also of a large size, while the other two are quite small.

Fam. Podophthalmides.

Gen. Podophthalma, Capello.

The examination of the examples described below long ago convinced me that the genus *Podophthalma* is closely allied to *Ocyale*. This is contrary to the conclusion lately arrived at by M. Simon (Bull. Soc. Zool. de France, 1876, séance du 7 Juillet), who considers *Podophthalma* to belong to the family Oxyopides. The form of the cephalothorax and maxillæ, as well as the position of the eyes, are totally different from those of *Oxyopes*; there is, however, perhaps some affinity between them; at any rate there is a certain resemblance in the general form of *Podophthalma* and *Oxyopes*; but even in this respect the resemblance between the former and *Ocyale* is still more close, while in the form of the cephalothorax there is a very striking similarity; and if in *Ocyale* the lateral eyes of the anterior row were separated a little more from each other, and seated at the prominent fore corners of the clypeus, this would make the eye-position exceedingly like that of *Podophthalma*. The species of *Ocyale* used to be placed in the genus *Dolomedes*. All arachnologists, I believe, now separate them from the latter genus, while still retaining them, next to it, in the family Lycosides. I have myself long since felt the necessity for constituting a family Podophthalmides for *Podophthalma* and one or two other (as I then conceived) allied genera, forming a passage from the Thomisides to the Lycosides through *Ocyale*. I have recently found reason to doubt the family affinity between

Podophthalma and those others which I had imagined formerly to be allied genera, viz. *Labdacus*, Cambr., and *Triclaria*, C. Koch. I would now suggest that *Ocyale* should be joined with *Podophthalma* to form a family, Podophthalmides, which might be placed between the Lycosides and Sphasides, and followed by the family Salticides; or perhaps a yet more natural arrangement would be, still to place the Podophthalmides, as I have hitherto done, between the Thomisides and Lycosides. In this case *Triclaria* and *Labdacus* would form a transition from the Thomisides to the Podophthalmides, and the latter, although followed immediately by the Oxyopides, would lead unmistakably to the Lycosides through *Ocyale*. The Oxyopides would, indeed, thus intervene between *Ocyale* and *Dolomedes*; but of course this kind of discrepancy cannot be always avoided in a linear arrangement.

In any case *Triclaria* and *Labdacus*, both of which have three terminal tarsal claws, must be separated from the Thomisides, and should form a family (Triclarides) between them and the Podophthalmides. The arrangement would thus be THOMISIDES, TRICLARIDES, PODOPHTHALMIDES, OXYOPIDES, LYCOSIDES, SALTICIDES.

PODOPHTHALMA ELLIOTI, sp. n. (Plate LVII. fig. 6.)

Adult male, length very nearly 9 lines,

The *cephalothorax* of this fine species is oval, much flattened above, and the fore part of the caput, especially the clypeal portion, considerably produced; at each corner of this part there is a strong, somewhat cylindrical, rather elongated, tubercular prominence, beneath the fore extremity of which is one of the fore lateral eyes. The colour of the cephalothorax is yellow-brown, with a broadish paler margin and central band; and it is pretty densely clothed with coarse greyish-white pubescence, almost entirely concealing the real colour of the surface. The longitudinal thoracic indentation is strong, and the ordinary converging furrows well marked.

The *eyes* are in four transverse rows, 2, 2, 2, 2; or they may be perhaps more correctly described as forming a large quadrangular figure of four eyes, and about the middle of it is another small quadrangle of the remaining four. The anterior side of the larger quadrangle is longer than the posterior one, while the posterior side of the inner quadrangle is longer than the anterior; in both figures the length is greater than the breadth. The eyes of the foremost row are the largest of the eight; and this row is the same distance from the next one as the latter is from the posterior (or fourth) row, the third row being equidistant between the second and fourth. The eyes of the third row (which are rather smaller than those of the fourth) are separated by an eye's diameter; and those of the second row, which is the shortest of the four, are also much the smallest, and are divided from each other by an eye's diameter. The eyes may also be described as forming a St. Andrew's Cross, whose base is rather longer than the width of the upper part.



The *legs* are long and moderately strong, furnished with hairs, bristles, and strongish spines; their relative length is 1, 4, 2, 3, or 4, 1, 2, 3, the difference between 1 and 2 being slight (in the only male examined the fourth pair were wanting); the shorter hairs are white, and give a grey hue to the legs, whose real colour is yellow-brown with here and there a paler annulus. Each tarsus ends with three claws, of which the superior pair are distinctly pectinated.

The *palpi* are moderate in length and strength, and their colour and clothing of grey hairs are like those of the legs; the radial joint is a little longer and stronger than the cubital, being enlarged gradually towards its fore extremity, where, on the outer side, is a short, deep red-brown, curved, blunt-pointed, corneous apophysis; there is also a long, tapering, spine-like, prominent bristle at the inner side of its posterior extremity; the digital joint is large and hairy, and its length exceeds that of the radial and cubital joints together, being almost, if not quite, equal to that of the humeral joint; in its general form and appearance the digital joint is like that of *Tegenaria* and *Ocyale*, the fore extremity being much produced into a long, narrow, tapering point. The palpal organs are placed beneath the posterior half of the digital joint, and comprise several strong, bulbous-looking, corneous processes, each terminating in a sharp point.

The *falces* are strong, tolerably long, and straight, but directed rather backwards towards the sternum; they are similar to the cephalothorax in colour, and are also clothed with grey hairs and a few prominent dark bristles.

The *maxillæ* are strong, tolerably long, broader at their upper extremity than at the middle, and straight, almost exactly resembling those of *Ocyale*, *Dolomedes*, and many *Lycosæ*, their colour and clothing being similar to those of the falces.

The *labium* is of a short oblong form, half the length only of the maxillæ, and truncated at the apex; this is paler than the rest, the general colour being like that of the maxillæ.

The *sternum* is of a short heart-shape, and its colour and clothing are like those of the falces.

The *abdomen* is long, and tapers gradually to its hinder extremity; its general colour is yellowish brown, clothed with hairs, most of which have a greyish hue; the upperside is occupied by a broad, tapering, longitudinal dark-brown band, whose margins at the hinder part are bluntly denticulate; this band is bordered on each side by a pale yellow-brown stripe, clothed densely with white hairs; and another similar longitudinal stripe occupies the middle of its anterior portion; and on each side of this latter stripe is a largish, round, dark-brown, impressed spot.

The *female* resembles the male, but is larger. In the female the legs of the fourth pair appear to be the longest; and probably those of the male are also similarly proportioned. The spinners are short, two-jointed, of equal, or nearly equal, length; and those of the inferior pair are the strongest. The form of the genital aperture is peculiar and characteristic.

Several adult females and one adult male of this species were most kindly given to me, among other Spiders, by Sir Walter Elliot, K.C.S.I., by whom they were found some years ago in East Central India. Having been preserved in spirit for some years, it is probable that their present colours are not quite the same as those of the living Spider.

PODOPHTHALMA AFFINITATA, sp. n.

A portion only of this Spider has come before me; this portion consists of the cephalothorax and falces, together with the maxillæ, labium, sternum, and legs, as far as, and including, the femora. It is evidently nearly allied to *P. bayoniana*, Capello; but as it differs in the colour, as well as in the size of the eyes, I am inclined to describe it as distinct, although, of course, no details of the abdomen and other absent parts can be given.

The colour of the cephalothorax, as well as of all the other parts above mentioned, is yellow. The form also of the cephalothorax appears to be more flattened than in Capello's type species; and when looked at sideways there is no difference in the convexity of the caput and thorax.

The eyes are on black tuberculate spots; the length of the posterior and anterior rows is equal; the interval between those of the third row (or that next to the posterior one) is less than an eye's diameter: these two eyes are rather the largest of the eight; those of the first and fourth rows are next in size, and are apparently about equal. The interval also between those of the second row is less than an eye's diameter; and the intervals between the second and third, and the third and fourth rows are equal, being less than that between the second and first. The distance between each eye of the second row and that of the first row, on its side, is considerably less than the distance between it and the eye of the fourth row on its side. The length of the rectangle formed by the eyes of the first and fourth rows is greater than its breadth, but evidently not as much greater as it is represented to be in the figure of *P. bayoniana*, where also the posterior row of eyes is given as longer than the anterior one.

From the relative lengths of the femora I should judge the relative lengths of the legs to be 4, 1, 2, 3.

The length of the cephalothorax is very nearly 3 lines.

The falces are slightly divergent.

The fragment from which the above notes have been made was received in a small collection of Spiders sent to me by Mr. Henry Rogers from the west coast of Africa, on the banks of the river Coanza.

PODOPHTHALMA HILARIS, sp. n. (Plate LVII. fig. 7.)

Immature female, length 7½ lines.

In general form and appearance this Spider is much like *P. elliottii*: its colours, however, are much richer; and its markings, as well as the relative size of the eyes differ.

The *cephalothorax* is of a dark rich yellowish brown colour with a very narrow marginal yellow line, and a longitudinal yellow stripe

along nearly the middle of each side, together with a narrow stripe or line of the same colour along the middle from the second row of eyes, each to the posterior margin; all these yellow lines and stripes are thickly clothed with white hairs.

The *eyes* are in the same position as those of *P. elliottii*, but those of the third row are smaller in proportion than in that species, being scarcely larger than those of the second row; those of the fourth (or posterior) row are also smaller.

The *legs* are long and rather slender; their relative length is 4, 1, 2, 3; and they are of a brownish-yellow colour, the femora considerably clouded with brown. They are thinly clothed with white pubescence, as well as other hairs, bristles, and rather slender spines.

The *palpi* are moderately long, of a yellowish hue, and furnished with hairs, long bristles, and slender spines.

The *falces* are rather long and strong, prominently rounded in profile, almost perpendicular, of a yellowish colour, striped with brown on their basal half, and clothed with bristly and white hairs.

The *maxillæ* are straight, enlarged and rounded at their extremities, and, together with the labium (which is of an oblong-oval form truncated at its apex), of a yellowish hue.

The *sternum* is heart-shaped, yellow, with two dark-brown, irregular, parallel stripes or markings along the middle, and clothed with white hairs.

Abdomen long, narrow-oval, much produced and tapering to the spinners. The upperside is pale yellowish, the middle line occupied by a broad, tapering, dark, rich-brown longitudinal band strongly and distinctly denticulated along the whole of its posterior half; the middle longitudinal line of this band is charged with a series of reddish yellow-brown markings, those on the hinder part being triangular and representing the normal angular bars or chevrons; immediately outside the margin of the central brown band, on each side, is a narrow stripe of white hairs; a broadish dark-brown band runs along each side, and is traversed obliquely by a yellowish stripe. The lower part of the sides is pale yellow thinly spotted with brown; and the underside is more of a yellow-brownish hue. These parts, and, indeed, the whole abdomen, are more or less clothed with short grey and white hairs. The spinners are short, two-jointed, compact, and equal in length, those of the inferior pair being the strongest.

Four immature examples of this fine and handsome species were received, through the kindness of Mr. R. H. Meade, of Bradford, from Madagascar.

PODOPHTHALMA INCERTA, sp. n. (Plate LVII. fig. 8.)

Immature female, length not quite $2\frac{1}{2}$ lines.

This Spider is of very great interest, because by a slight modification in the position of the eyes, the close relationship between *Podophthalma* and *Ocyale* is very distinctly shown.

The *cephalothorax* is of the ordinary shape, oval behind, considerably compressed laterally at the caput, and truncated on lower

margin of clypeus; its colour is yellow, with a few small brown markings round the lateral margin, and a faint brown, broad, longitudinal central band divided longitudinally on the caput by a narrow yellow line, and broken in upon by short radiating yellowish streaks indicating the normal thoracic indentations.

The *eyes* are on conspicuous black tubercular spots, and vary a little from the normal position, those of the first and second rows forming together a curved line of four eyes, the curve directed backwards; this is caused by the group which consists of the second, third, and fourth rows being advanced so much closer towards the fore margin of the clypeus, while still retaining their own relative position. This arrangement brings the general position of the eyes into very nearly that of the genus *Ocyale*; the exterior eyes, however, of the first row still occupy the same position as those of the first row in the typical *Podophthalma* (*i. e.* quite at the lower corners of the clypeus), and are also seated in front of, and rather below, a tubercular eminence, though of less length than in the other (already described) species of *Podophthalma*. Another characteristic of the eyes of this Spider is that they are of considerable size, and vary from each other very slightly in that respect.

The *legs* are long, slender, and of a pale yellow colour, faintly annulated with yellow-brown. They were entirely destitute of hairs and spines; but there were evidences of these having been considerably rubbed off. Their relative length appears to be 4, 1, 2, 3.

The *palpi* are similar to the legs in colour, slender, and of moderate length.

The *falces*, *maxillæ*, and *labium* present no difference from the normal form. They are of a pale yellow colour, except the labium, which is pale brown.

The *sternum* is heart-shaped, brown, with a distinct and complete dentated border, and central longitudinal oval patch of yellow.

The *abdomen* is oval, not so attenuated as in the other species, but more convex towards the anterior extremity; it is of a brownish-yellow colour, marked variously both above and below with brown stripes and markings, the sides and a broad transverse band on the underside just behind the middle being closely marked with white cretaceous spots and patches.

A single example only, received in company with those, already described, of *P. hilaris*, from Madagascar.

I have had some doubt whether it would not be proper to place this Spider in a new genus, on account of the difference in the eyes from the typical *Podophthalma*, especially as the next Spider described (*P. diversa*, from Brazil) has a similar general position of the eyes, differing, however, in the two eyes of the second row (or rather the intermediate ones of the first) being much smaller than the rest, and so more nearly resembling those of the typical *Podophthalma*. On the whole, therefore, it is perhaps best at present to await the discovery of other species before forming a new genus for these two. This and the next species show some resemblance to *Lycosides*, Linn. (*Textrix*, Sund.), of the family Agelenides.

PODOPHTHALMA DIVERSA, sp. n. (Plate LVII. fig. 9.)

Immature female, length 6 lines.

This Spider is nearly allied to *P. incerta*, Camb.

The *cephalothorax* is broad, round, oval behind, greatly constricted laterally at the caput, which is rather produced and truncated in front. Although closely resembling in its form that of the typical *Podophthalma*, the cephalothorax is perhaps more nearly like that of *Agelena* and *Textrix*, with which genera there is no doubt an affinity, although in a linear arrangement these genera are removed at a great distance from *Podophthalma* (see introductory remarks, p. 558). The colour of the cephalothorax is yellow-brown, pretty thickly clothed with greyish-yellow pubescence.

The *eyes* are in the same position as those of *P. incerta*. The exterior ones, however, of the foremost row are not so near to the exterior (lower) corners of the clypeus; and the central pair of this row are distinctly (rather considerably, in fact) smaller than the rest. In this Spider, as well as in the last, *P. incerta*, the ocular area, looked at in profile, is less flattened, and thus the eyes of the third row project more forwards.

The *legs* are moderate in length and strength; their relative length is 4, 1, 2, 3. They are of a pale yellow-brown colour, furnished with hairs, bristles, and slender spines; and each tarsus terminates with three curved claws, of which those of the superior pair are strong and pectinated, and the inferior one is small.

The *palpi* are slender, of moderate length, and similar to the legs in colour and armature, terminating with a single, curved, pectinated claw.

The *falces* are straight, perpendicular, moderate in length and strength, similar to the cephalothorax in colour, and furnished in front with numerous bristles.

The *maxillæ* and *labium* are of normal form; the former are dull pale yellow, and the latter is tinged with yellow-brown.

The *sternum* is yellow-brown, darkest along the middle, of an oval heart-shape, and clothed with numerous erect bristly hairs.

The *abdomen* is of an elongate-oval form, pretty densely clothed with grey and other hairs intermixed with some prominent dark bristly ones. It is of a yellowish-brown colour, with a broad central longitudinal band on the upperside, the margins indented, and each indentation marked conspicuously with a patch of white hairs, and joined to the corresponding indentation on the opposite side by a slightly curved line of similar hairs; these transverse curved white lines are most conspicuous on the hinder half. The sides are closely marked with parallel broken lines of dark-brown elongate spots; and the underside is tinged with darker yellow-brown, which, however, is obscured by the clothing of short yellow-grey pubescent hairs.

The spinners of the superior pair are rather longer than those of the inferior, though less strong.

Several examples (all immature females) were collected by Mr. Henry Rogers, in Minas Geraes, Brazil.

Fam. Dinopides.

Until lately one genus alone of this group (*Dinopis*, Macleay) had been characterized. It has always appeared to me impossible to place *Dinopis* in any known or recognized family group; and consequently I have long since constituted it a family of itself, placing it between the Lycosides and Salticides, rather for want of a better place for it than for any really close affinity to either of them. It is more probable that its place will some day be found to be much nearer to the Agelenides than to either the Lycosides or Salticides. Dr. Ludwig Koch, writing in 1867 (Verh. k.-k. zool.-bot. Gesell. in Wien, 1867, p. 230), says that the position of *Dinopis* is without any doubt in the family Eresides, giving as a proof the position of the eyes and possession of calamistra and inframamillary organ. It would seem, however, scarcely possible to place in juxtaposition two Spiders more unlike each other than *Dinopis* and *Eresus*, whether we consider the general form, or any special point of structure from which a family affinity could be deduced. The mere position of the eyes is quite insufficient. *Podophthalma* has an eye-position very closely resembling *Dinopis*; and between other widely separated genera there may also be often found a similar eye-position. Relying upon this only, Walckenaer once placed a Theraphosid (*Idiops*) in the genus *Sphasus*; and as regards calamistra and the mamillary organ, these may certainly be considered of family value in some groups of genera possessing them, as in *Dictyna*, *Amaurobius*, *Titanœca*, and *Lethia*; but when we find them in such widely different Spiders as *Filistata*, *Œcobius*, and *Rhion*, all family value, at least with respect to them, vanishes. So, it appears to me, it is also in regard to *Dinopis*, where the flattened cephalothorax, enormous central pair of eyes, long and excessively slender legs, with a very peculiar form of maxillæ, labium, and sternum, must have far more weight than the calamistra and general position of the eyes taken by themselves. M. Simon has recently (Bull. Soc. Zool. de France, 1876, p. 218) characterized a second genus (*Menneus*) unmistakably allied to *Dinopis*, but, along with some minor characters, differing remarkably in having the tarsi of the first pair of legs subdivided. *Menneus* has also calamistra; and so also has another Spider, allied both to *Dinopis* and *Menneus*, and upon which I propose presently to found a third genus of the family Dinopides. This Spider, for which I propose the generic name *Avella*, has the flattened cephalothorax, the long slender legs, the peculiar maxillæ and labium, as well as the general eye-position of *Dinopis*; but the central pair of eyes are but little larger than the rest. With *Menneus* it agrees in having the tarsi of the first pair of legs subdivided, though it seems to me, with respect to other generic characters, quite distinct. It however possesses calamistra and an inframamillary organ (though the calamistra were of rather a peculiar nature). It is therefore probable that these portions of structure will here also prove a good family character within the limits of the Dinopid group; but this remains to be proved. Of course the family character thus attached

to these curious points of structure would at once fail if an undoubted Dinopid were found without them.

Gen. nov. AVELLA.

Cephalothorax longer than broad, oval behind, constricted laterally at the caput, and truncated in front; the lower corners of the clypeus prolonged into eye-bearing tubercular prominences; upper surface much flattened, the thorax and caput being on the same low level. The caput runs in a straight line to the middle pair of eyes, when it drops abruptly, at right angles, to the falces.

Eyes small, in three transverse rows, 4, 2, 2, and not differing greatly in size; the foremost row (of four) is strongly curved, the convexity of the curve directed backwards; the laterals of this row are placed at the extremity of cylindrical tubercles springing from the corners of the clypeus. Those of the second row are a little the largest of the eight. Those of the third or posterior row form a line not nearly so long as that formed by those of the first row.

Legs long, slender; relative length 1, 2, 4, 3—1 and 2 greatly exceeding 3 and 4 in length; the tarsi of the first pair subdivided. Each tarsus ends with three curved claws, of which the superior pair are pectinated; and there is a calamistrum on the metatarsus of each of the fourth pair.

Palpi short, slender, and terminating with a single curved pectinated claw.

Falces long, strong, and divergent.

Maxillæ long, strong, considerably constricted just above the insertion of the palpi, and thence greatly divergent, or bent outwards, and rounded at their extremities.

Labium oblong but broader at the base than at the apex, which is truncated; its length slightly exceeds one half that of the maxillæ.

Sternum of a somewhat subtriangular form, but much elongated.

Abdomen long, broadest in the middle, where there is a strong prominence on each side, with a supernumerary mamillary organ in front of the ordinary spinners.

AVELLA DESPICIENS, sp. n. (Plate LVII. fig. 10.)

Adult female, length rather over 4½ lines.

The *cephalothorax* is of a yellow-brown colour, with a broad central longitudinal band of a paler hue; this band runs through to the central pair of eyes; it is rather wider on the caput than on the thorax, and is thickly clothed with a grey pubescence, the rest of the cephalothorax being thinly clothed with similar pubescence. The area comprised by the six foremost eyes is of a rather chocolate red-brown colour.

The *eyes* may be described not only as in three transverse rows, but as also in two quadrangular figures, a large one with a small one in the middle of it; the foremost pair of the central quadrangle are the smallest of the eight, and separated from each other by about three diameters, and from the hinder pair by about two; the hinder pair are considerably larger and form a longer line than the

fore ones, being also separated from each other by two diameters, the distance from each to the eye of the hinder row on its side being somewhat greater than this. The tubercles, at the extremity of which the foremost eyes of the outer quadrangle are placed, are directed strongly outwards and downwards.

The *legs* are brown, slightly tinged with yellow, and furnished with hairs and a few short spines. The calamistra on the metatarsi of the fourth pair begin close to the hinder extremity of the joint, rather on the inner side, and continue along it for about one third of its length; the terminal tarsal joint of the first pair is less than a fourth of the length of the normal joint.

The *palpi* are similar to the legs in colour and annulation.

The *falces* are long, strong, perpendicular, and divergent, and of a dark, slightly yellowish brown colour.

The *maxillæ* and *labium* are of a similar hue, the apex of the latter and the inner sides of the former being of a pale whitish colour. The maxillæ are also rather closely fringed with hairs on their inner sides and at their extremities.

The *sternum* is of a dark brown and dull orange-yellowish hue mixed.

The *abdomen* was much shrunken; but its form is apparently elongate-oval, truncated in front, broad across the middle, where there is a strong somewhat conically pointed prominence on each side. It is clothed with short hairs; and the femoral hue is a mixture of brown-grey and reddish-yellow. The lateral prominences are joined by a somewhat raised transverse curved ridge clothed with grey hairs, the colour of the abdomen in front of the ridge being dark reddish yellow-brown; and extending from it to the spinners is a broad dentated paler yellow-brown band.

A single example of this very interesting and important Spider was received, among numerous examples of other groups, from Rockhampton, Australia, through Mr. E. W. Janson, in the present year (1877). The relation of this Spider to *Dinopis* and *Menneus* is noted above.

Fam. Salticides.

Gen. nov. Athamas.

This genus is closely allied to *Lyssomanes*, Hentz, as well as to *Jelskia*, Tacz. It differs, however, from both in the shortness of the cephalothorax and also of the abdomen. From *Lyssomanes*, Hentz, it differs in the superior and inferior spinners being of equal length, whereas in that genus those of the superior pair are much longer, slender, and three-jointed.

Cephalothorax short, massive, quadrate, very convex above; the sides and hinder slope almost vertical.

Eyes very unequal in size, disposed in four transverse lines of two each, and almost of the same length.

Legs rather slender, and moderately long; those of the first pair longest, and of the second pair shortest.

Maxillæ rather short, slightly divergent, and much the broadest at their extremities, which are rounded.

Labium short, small, and of a somewhat curviangular form.

Abdomen small, short, oval, and sloping from its most convex part, near the fore margin, to the spinners.

ATHAMAS WHITMEEI, sp. n. (Plate LVI. fig. 11.)

Adult male, length 1½ line.

The *cephalothorax* of this very pretty and distinct Spider is of a yellow-brown colour, with a large pale patch on each side of the hinder extremity, and the ocular area black, thinly clothed with short white hairs, and shining, in some lights, with a strong metallic dark violet hue; a pale stripe densely clothed with bright white squamose hairs runs through the middle of the hinder half of the ocular area to the beginning of the posterior slope; there is also a spot of similar hairs on each side towards the hinder part, and another on each side near the hinder part of the ocular area, just below the eyes of the third row; the height of the clypeus is rather less than the diameter of one of the first row of eyes.

The *eyes* may be described not only as in four transverse rows or four pairs, but as in two longitudinal, and nearly straight, parallel lines. The foremost pair are of enormous size, contiguous to each other, and placed on the vertical front of the caput; the two next to them are on the upper edge of the caput, and form a line but very slightly longer than the first pair; they are also large, but not nearly so large as the former, and are separated by rather less than two diameters; those of the next row are very minute and not easily distinguished, they form a line shorter than the last-mentioned eyes, but separated by a rather wider interval; these minute eyes are about halfway between those of the second and fourth rows. Those of the fourth row are considerably smaller than those of the second, and are divided by an interval of three diameters. The line, however, that they form is nearly of the same length.

The *legs* are yellow, the femora and the two other basal joints of the first pair being much stronger than the rest, and brownish black on each side. This, however, is apparently not a constant character; or at any rate it does not always exist at the first coming of the Spider to maturity, but probably is acquired later; for in one of the examples before me the first pair are of the same colour as the rest, and the femora of only ordinary comparative strength, and the legs themselves shorter and weaker. They are furnished sparingly with hairs and a few slender spines, except the first pair, in which there are five pairs of long strong spines beneath the tibiæ, and three pairs (rather longer and stronger still) beneath the metatarsus, disposed in two longitudinal parallel rows; these spines are much less strongly developed in the example before mentioned, whose fore legs are less strong than those of the other specimen.

The *palpi* are pale yellow, short and slender; the radial joint is, if any thing, a little shorter than the cubital, and has a very small, slender, pointed apophysis at its fore extremity on the outer side;

this apophysis is very difficult to distinguish clearly; the digital joint is of a narrow form, and tapers a little towards its fore extremity, its length being nearly, if not quite, equal to that of the cubital and radial joints together; all these three joints are clothed with longish coarse white hairs. The *palpal* organs are simple but well developed; they are not conspicuous, being of a similar colour to the rest of the palpus, and much obscured by the white hairs on the digital and radial joints.

The *falces* are short, straight, vertical, and not very strong; they are of a brownish-yellow colour with a broad rather oblique dark yellow-brown longitudinal stripe on the fore side.

The *maxillæ* are yellow-brown, paler at their extremities.

The *labium* is also yellow-brown, palest at the apex.

The *sternum* is heart-shaped and of a pale yellow colour.

The *abdomen* is of a palish yellow hue; on the fore half of the upperside a clearer yellow elongate-oblong central marking is indicated by a dark-brown dentated marginal line, and terminates posteriorly with a short transverse curved dark-brown stripe, behind which, again, are two longitudinal curved dark-brown markings inclosing a circular area covered densely with white squamose hairs which extend forwards also to the transverse stripe above described. The sides are marked with a few dark-brown spots and markings; and on each side of the fore extremity of the oblong central marking is a large patch of white squamose hairs. In front, below the fore margin, are some coarse, bristly, black, upturned hairs.

The spinners are of a blackish hue, tipped with pale yellowish; those of the inferior pair are much the strongest, though of the same length as the superior pair; and those of the central pair are nearly as long as the rest. There is evidently some variety in the abdominal markings of this species, since in the other example before noted the upperside of the abdomen is generally suffused with dark blackish brown, showing faintly the longitudinal oblong central yellowish marking on the fore part; the posterior and two anterior large patches of white squamose hairs, however, are even more conspicuous in this than in the other example.

Two adult male examples were received from the Rev. S. J. Whitmee, by whom they were found in the island of Samoa, and kindly sent to me, together with a few other Spiders.

LIST OF SPIDERS.

Fam. Gasteracanthides.

Cyrtarachne longipes, sp. n., river Coanza, p. 559, Pl. LVI. fig. 1.
—— *furcata*, sp. n., Rockhampton, p. 560, Pl. LVI. fig. 2.
—— *hobsoni*, sp. n., Bombay and Ceylon, p. 562, Pl. LVI. fig. 3.

Fam. Cryptothelides.

Cryptothele ceylonica, sp. n., Ceylon, p. 563, Pl. LVI. fig. 4.

Fam. Eripides.

Eripus quinquegibbosus, sp. n., Minas Geraes, p. 564, Pl. LVI. fig. 5.

Fam. Podophthalmides.

Podophthalma ellioti, sp. n., East Central India, p. 567, Pl. LVII. fig. 6.
—— *affinitata*, sp. n., river Coanza, p. 569.
—— *hilaris*, sp. n., Madagascar, p. 569, Pl. LVII. fig. 7.
—— *incerta*, sp. n., Madagascar, p. 570, Pl. LVII. fig. 8.
—— *diversa*, sp. n., Minas Geraes, p. 572, Pl. LVII. fig. 9.

Fam. Dinopides.

Avella, g. n.

Avella despiciens, sp. n., Rockhampton, p. 574, Pl. LVII. fig. 10.

Fam. Salticides.

Athamas, g. n.

Athamas whitmeei, sp. n., island of Samoa, p. 576, Pl. LVI. fig. 11.

EXPLANATION OF PLATES LVI. AND LVII.

Plate LVI.

Fig. 1. *Cyrtarachne longipes*, sp. n., ♀.
a, full figure, upperside, natural size; *b*, profile, without legs, enlarged; *c*, maxillæ, labium, and sternum.

2. *Cyrtarachne furcata*, sp. n., ♀.
a, full figure, upperside, enlarged; *b*, profile, without legs; *c*, profile of cephalothorax, more enlarged; *d*, outline, natural size.

3. *Cyrtarachne hobsonii*, sp. n., ♀.
a, full figure, upperside, enlarged; *b*, profile, without legs; *c*, natural length of Spider.

4. *Cryptothele ceylonica*, sp. n., ♀.
a, full figure, upperside, enlarged; *b*, profile, without legs; *c*, fore part of caput, from behind, showing the eyes; *d*, maxillæ and labium; *e*, natural length of Spider.

5. *Eripus quinquegibbosus*, sp. n., ♂.
a, full figure, upperside, enlarged; *b*, caput, in front; *c*, profile; *d*, abdomen from behind; *e*, natural length of Spider.

11. *Athamas whitmeei*, sp. n. et g. n., ♂.
a, full figure, upperside, enlarged; *b*, profile, without legs; *c*, fore part of caput, from behind, showing position of the eyes, *d*, maxillæ and labium; *e*, natural length of Spider.

Plate LVII.

Fig. 6. *Podophthalma ellioti*, sp. n., ♀.
a, full figure, upperside, nearly of natural size; *b*, fore part of caput, showing position of the eyes; *c*, *d*, palpus of male; *e*, radial, and portion of cubital, joint of palpus, ♂, *f*, natural length of Spider.

7. *Podophthalma hilaris*, sp. n., ♀.
a, full figure, upperside, enlarged; *b*, profile of cephalothorax; *c*, natural length of Spider.

8. *Podophthalma incerta*, sp. n., ♀.
a, full figure, upperside, enlarged; *b*, fore part of caput, from in front, showing position of the eyes; *c*, natural length of Spider.

9. *Podophthalma diversa*, sp. n., ♀.
a, full figure, upperside, enlarged; *b*, fore part of caput, from in front, showing position of the eyes; *c*, natural length of Spider.

10. *Avella despiciens*, sp. n. et g. n., ♀.
a, full figure, upperside, enlarged; *b*, profile of cephalothorax; *c*, fore part of caput from in front, showing position of the eyes; *d*, part of metatarsus of one of fourth pair of legs, showing calamistrum; *e*, natural length of Spider.

5. Note on the Polish Swan. By J. H. Gurney, F.Z.S.

[Received June 5th, 1877.]

On the 12th April, 1876, the female of a pair of "Polish Swans," received by me some weeks previously from the Gardens of this Society, completed laying a clutch of six eggs and commenced her incubation—there being no other Swans in this parish (Northrepps), and consequently no possibility of intermixture.

On the 21st and 22nd May the eggs were hatched, with the exception of one that was addled. I saw the cygnets on the 23rd, and made the following note respecting their coloration:—"The upper parts are brownish grey with a slight rufous tinge; the head, throat, and breast, where visible above the water, are white, but the white is not separated from the grey by any defined line, the two tints gradually blending into each other." On the 2nd June they were visited by an ornithological friend, Mr. Thomas Southwell, who described them at that date in the following words:—"The buff tinge was hardly perceptible, except on the back, which appeared of a rich creamy buff, with the underparts nearly pure white." Mr. Southwell brought with him for comparison the skin of an ordinary cygnet of similar age, which was about equally white on the head and underparts, but decidedly greyer on the back, and without any drab tint, according to a memorandum which I made at the time.

On the 7th June I made the following note:—"The cygnets seem to be gradually losing their drab tint on the back, though it is still visible, but it seems to be merging into a pale grey, almost white; a pure white spot, about the size of a pea, is conspicuous on the down of the forehead immediately above the bill.

On the 17th June the largest of the five cygnets was killed by a rat, which devoured the head, neck, and part of the back; the down on the remaining portion of the bird was pure white, the bill and feet being pale greenish-grey. On the 22nd I had a close view of the remaining four cygnets: their heads and necks were quite white; but the white spot on the forehead was still apparent, being a brighter white than the rest of the head; the down on the back was white, but apparently with slight remains of a drab tinge about the roots; the smallest cygnet appeared the whitest of the four. On the 17th July I again had a close view of the cygnets, and then made the following memorandum:—"The three largest are beginning to show the tail-feathers and some slight sprouts of wing-feathers; all these, with the down adjacent to them and the down on the thighs, are a pale cinnamon-brown; elsewhere they are white, except a slaty tint on the forehead, beneath which the little white frontal spot is still visible. The smallest cygnet, which is the most backward, is still white all over." On the 24th July small feathers of a cinnamon-brown were visible between and adjoining the wings of

the three largest cygnets, and the white down was in course of being moulted, flying off from the birds when they moved briskly; the white frontal spot was still perceptible. On the 3rd August the smallest and most backward cygnet died, being still in the down with the exception of a slight indication of the tail-feathers; it was tinged with brownish-grey on the wings and tail, and more slightly on the head, but elsewhere was white throughout. On the 27th September another cygnet died: it had lost its down and was well feathered throughout; its general colour was white; but the head and back of the neck were tinged with greyish brown; the feathers on the wing-coverts and back were also all more or less broadly tipped with a similar tint. The two surviving cygnets subsequently became pure white, but did not lose the greyish brown tint on the crown of the head till May 1877; and in fact one of them still (on June 4) retains traces of it. In the other bird it has been replaced by the ferruginous colour so common on the crown of the head of adult Swans, and which I think I have observed to be more conspicuous, in the ordinary race, in male than in female birds.

The old pair have again hatched a brood this spring, six in number; and the cygnets resemble those of last year, being of a pale greyish cinnamon-brown on the upper parts, but nearly white on the head. Whether the prevalence of this brownish-grey tint in both broods is an indication of one or both the parents not being quite true-bred, is a question which I am not competent to decide, but which may be worthy of consideration.

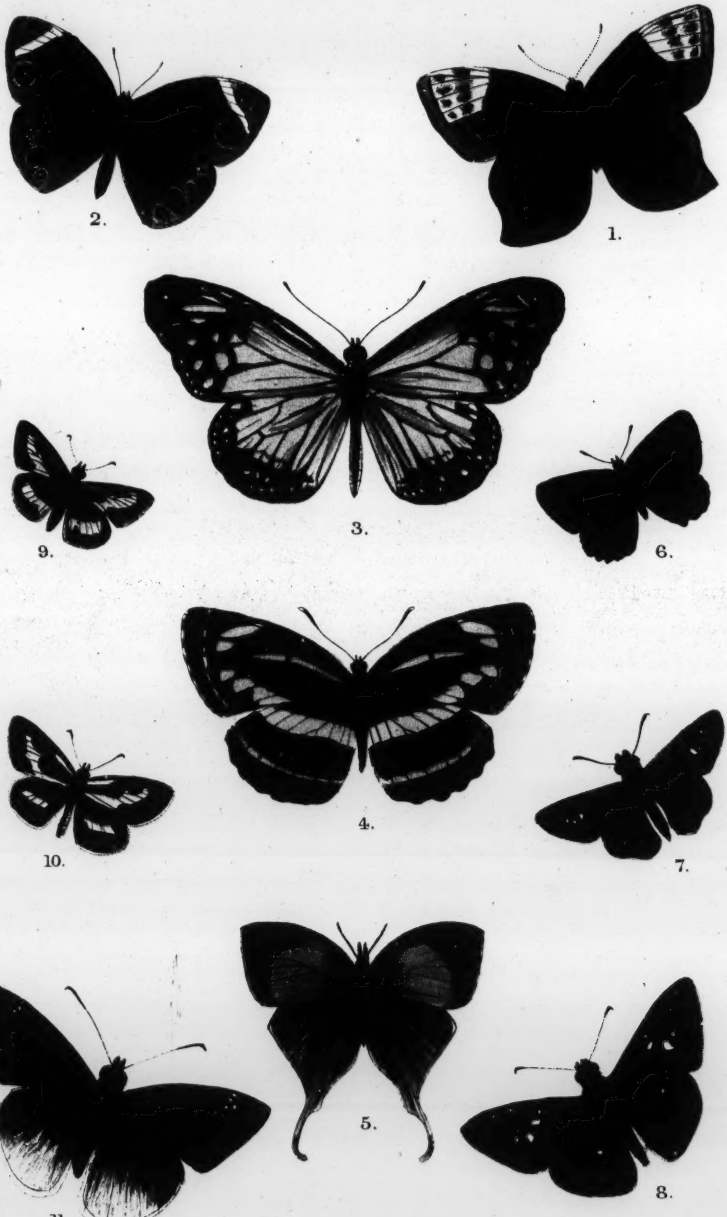
6. The Lepidopterous Fauna of the Andaman and Nicobar Islands. By F. Moore, F.Z.S., Assistant Curator, India Museum, London.

[Received June 7th, 1877.]

(Plates LVIII.–LX.)

Note.—The materials used for the accompanying paper were mostly collected in the S. Andamans by Mr. F. A. De Rœpstorff, the Deputy-Superintendent in charge of that Settlement. The specimens were forwarded to this country for disposal; and I have to thank the several gentlemen into whose hands they ultimately went for their kind permission to describe them. Those from the Nicobars were chiefly collected by Mr. R. Meldola, who accompanied the late Venus-Transit Expedition to those islands, to whom my thanks are also due.

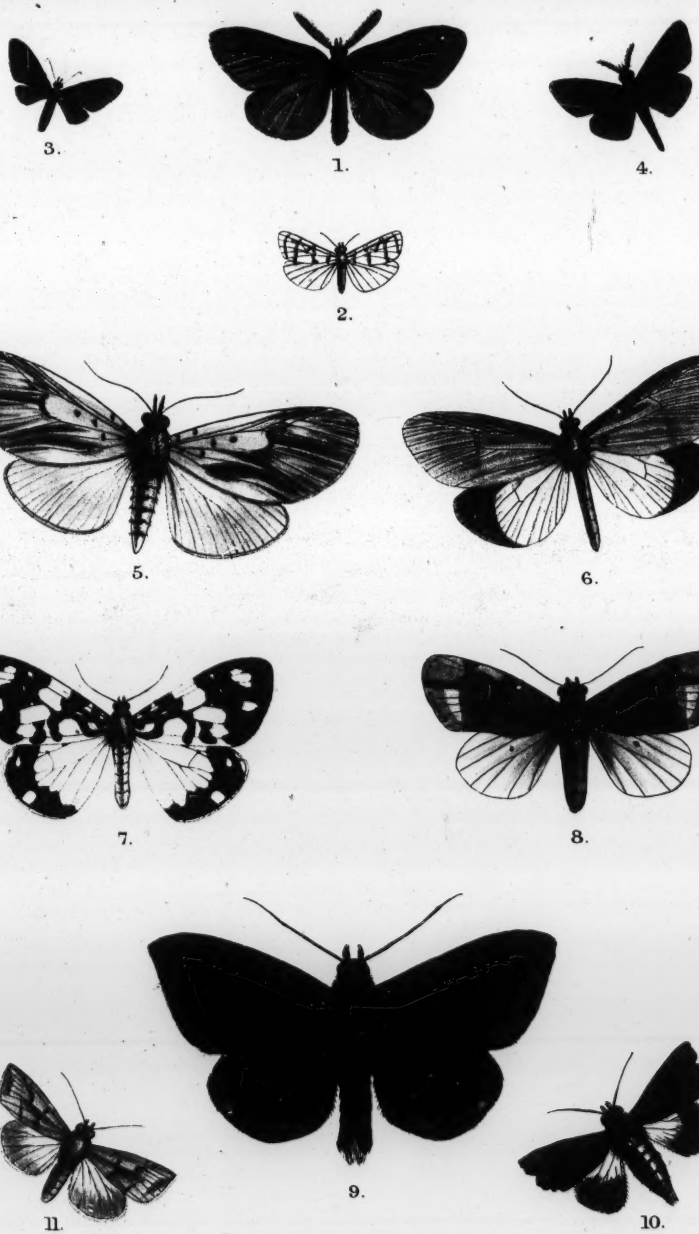
June 5th, 1877.



R. Mintern del. et lith. Mintern Bros. imp.

NEW ANDAMAN & NICOBAR LEPIDOPTERA.

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MUSEUM



R. Mintern del. et lith.

Mintern Bros. imp.

NEW ANDAMAN & NICOBAR LEPIDOPTERA.





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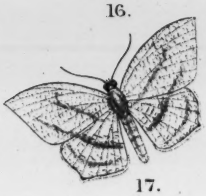
16.



18.



6.



17.

R.Mintern del. et lith.

Mintern Bros. imp.

NEW ANDAMAN & NICOBAR LEPIDOPTERA.

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DANAIS LIMNIACE, Cram. Pap. Exot. i. pl. 59. f. D, E.

D. leopardus, Butler, P. Z. S. 1866, p. 52.

Nicobars (Nankowry), April, *Meldola*.

DANAIS AGLEOIDES, Felder, Verh. zool.-bot. Ges. 1862, p. 486.

Nicobars (Sambelong).

DANAIS GRAMMICA, Boisd. Spec. Gén. Lép. i. pl. 11. f. 10 (1836).

Nicobars (Kamorta), *Meldola*, April.

DANAIS MELANOLEUCA, n. sp. (Plate LVIII. fig. 3.)

Male and female. Black: fore wing with white space within the cell, two thirds of space between lower median and submedian veins; four discal spots, an indistinct costal basal streak, three costal spots before the apex, two lower elongated streaks, followed by a dentate spot and three smaller rounded submarginal spots; some marginal white dots near posterior angle, and a small spot below the apex; the space within the cell with short, narrow, dusky streaks from its

[1] Of which 93 are new species.

end, and a median dusky line within the space below the median vein: hind wing with white space within the cell and between the veins to one third from outer margin, the upper spaces concave, and the lower conical externally; an indistinct dusky lunule crossing the end of the two lower median spaces, a prominent black bifid streak within the cell, and a line between lower median and submedian; a submarginal series of small white spots, two between each vein (two being obsolete in the male on the sexual mark), and a marginal series of seven smaller spots from anal angle. Head and thorax with white spots and streaks. Abdomen cinereous brown above, white beneath. Femora and tibiæ white-streaked.

Expanse, ♂ $2\frac{3}{8}$, ♀ $2\frac{7}{8}$ inches.

S. Andamans (Port Blair). In coll. H. Druce and F. Moore.

Near to *D. vitrina*, Feld.

Danais nesippus, Felder, Verh. zool.-bot. Ges. 1862, p. 486.

Nicobars (Sambelong).

Danais plexippus, Linn. S. N. i. 2. p. 767.

Nicobars (Nankowry and Kamorta), *Meldola*, April.

Euplœa novara, Felder, Verh. zool.-bot. Ges. 1862, p. 482; Novara Reise, Lep. ii. p. 317, pl. 39. f. 7.

Nicobars (Kar Nicobar).

Euplœa esperi, Felder, Verh. zool.-bot. Ges. 1862, p. 482.

Nicobars (Kar Nicobar).

Euplœa andamanensis, Atkinson, P. Z. S. 1873, p. 736.

S. Andamans (Port Blair).

Euplœa camorta, n. sp.

Male. Upperside—both wings dark blackish olive-brown, paler on outer margins; fore wing with a short, straight, narrow silky streak between lower median and submedian veins; hind wing with the anterior border broadly cinereous, the upper part of the cell being slightly greyish brown. Underside paler; fore wing with four bluish-white spots, one being on the costa above end of the cell, another at its lower end, the other two outside; the sexual streak long, narrow, and patch on hind margin pale flesh-colour; hind wing with seven median bluish-white spots.

Expanse $3\frac{1}{4}$ inches.

Nicobars (Kamorta), April 4th, 1875. In coll. R. Meldola.

Hestia agamarschana, Felder, Novara-Reise, Lep. ii. p. 351, pl. 43. f. 7 (1867).

S. Andamans (Port Blair).

Fam. Satyridæ.

Lethe europa, Fabr. Syst. Ent. p. 500 (1775); Hübn. Samml. Schmett. i. pl. 90. f. 1–4.

S. Andamans (Port Blair).

Melanitis leda, Linn. S. N. i. 2. p. 773 (1767).

S. Andamans (Port Blair).

Mycalesis medus, Fabr. Syst. Ent. p. 488 (1775).

Nicobars (Kamorta), April, *Meldola*.

Mycalesis drusia, Cram. Pap. Exot. i. pl. 84. f. C, D.

S. Andamans (Port Blair); Nicobars (Kamorta), April, *Meldola*.

Mycalesis samba, Moore, Catal. Lep. E.I. C. i. p. 233.

S. Andamans (Port Blair).

Mycalesis radza, n. sp. (Plate LVIII. fig. 1.)

Male. Upperside dark brown; fore wing with a narrow, oblique, subapical white band, below which is a large black ocellus with ochreous outer ring and a white central spot; hind wing with a smaller and less distinct ocellus near middle of outer margin. Underside brown; fore wing with a more prominent white oblique band and lower ocellus; two small geminate ocelli between the white band and apex; hind wing with an outer series of seven prominent ocelli enclosed within a narrow purple wavy line, the three upper and seventh ocelli small, fourth and sixth larger, the fifth largest. Nearest allied to *M. anaxias*.

Expanse $1\frac{4}{5}$ inch.

S. Andamans (Port Blair). In coll. H. Druce.

Elymnias cottonis (*Melanitis cot.*), Hewitson, Ann. N. H. 1874, xiv. p. 358.

S. Andamans (Port Blair).

Fam. Morphidæ.

Amathusia phidippus, Linn. S. N. i. 2. p. 752; Cram. Pap. Exot. i. pl. 69. f. A, B.

S. Andamans (Port Blair).

Discophora celinde, Stoll, Suppl. Cram. Pap. Exot. pl. 37. f. 1 (1790).

S. Andamans (Port Blair).

Fam. Nymphalidæ.

Cethosia nicobarica, Felder, Verh. zool.-bot. Ges. 1862, p. 484; Novara-Reise, Lep. iii. pl. 48. f. 7, 8, ♂.

Female. Blacker than the male; fore wing with the lower basal portion and interspaces in cell dark greenish grey; subapical marks broader, the lower dentate mark formed into a streak; hind wing with the basal portion pale greenish grey. Underside greenish brown (in the male dull vermilion), interspaces of basal streaks greenish (in the male bluish); black median transverse zigzag markings and

discal dentate marks, and spots, reddish white-bordered; a black-and-white marginal sinuous band.

Expanse, ♂ 3, ♀ 3½ inches.

Nicobars (Kondul); S. Andamans (Port Blair).

CIRROCHROA ANJIRA, n. sp.

Nearest allied to *C. aoris*. Differs in being less falcate in the fore wing, the male above having similar but more prominent black markings. In the fore wing the transverse discal sinuous line is more erect, and in the female is less pointed at the angles; the marginal double sinuous band is broader. The underside is darker in colour, the transverse pale lilac band broader on the fore wing and narrower on the hind wing; this band is also much less sinuous on its inner border.

Expanse, ♂ 2⅝, ♀ 2⅞ inches.

S. Andamans (Port Blair). In coll. F. Moore.

CYNTHIA EROTA, Fabr. Ent. Syst. iii. 1, p. 76; Butler, Catal. Fabr. Lep. in Brit. Mus. p. 115.

S. Andamans (Port Blair).

MESSARAS NICOBARICA, Feld. Verh. zool.-bot. Ges. (1862) p. 486.

Nicobars (Sambelong); S. Andamans (Port Blair).

ATELLA ALCIPPE, Cram. Pap. Exot. iv. pl. 389. f. G. H. (1782).

S. Andamans (Port Blair).

PYRAMEIS CARDUI, Linn. S. N. i. 2, p. 774.

S. Andamans (Port Blair).

JUNONIA ŒNONE, Linn. S. N. i. 2, p. 770; Cram. Pap. Exot. i. pl. 35. f. A, B, C.

S. Andamans (Port Blair).

JUNONIA NICOBARIENSIS, Felder, Verh. zool.-bot. Ges. 1862, p. 482.

Nicobars (Kar Nicobar).

DOLESCHALLIA PRATIPA, Felder, Wien. ent. Monats. iv. p. 399 (1860); Novara-Reise, Lep. iii. p. 406.

S. Andamans (Port Blair.)

KALLIMA ALBOFASCIATA, n. sp.

Upperside glossy greyish indigo-blue; fore wing with a median, oblique, cream-white band with irregular borders; hind part of wing indigo-blue, tinged with purplish lilac above posterior angle; apex broadly blue-black, with a small bluish-white subapical spot; a dark-bordered bluish-white diaphanous spot on middle of the disk; a submarginal, sinuous, blue-black line; hind wing indigo-blue, tinged with purplish lilac along upper part of exterior margin; costa

brownish; a submarginal sinuous blue-black line. Body greenish. Underside mottled greyish ochreous, black-speckled, varied with confluent brighter fasciæ on outer half; a pale-bordered dusky line from apex to tail; a subapical and discal spot on fore wing, and imperfect ocelli on hind wing.

Expanse $3\frac{2}{5}$ inches.

S. Andamans (Port Blair). In coll. H. Druce and F. Moore.

EURYTELA HORSFIELDI, Boisd. Faun. Madag. p. 54, ♂.

E. stephensi, Boisd. ibid. p. 55, ♀ (1833).

S. Andamans (Port Blair).

CYRESTIS FORMOSA, Felder, Novara-Reise, Lep. iii. p. 412 (1867).

S. Andamans (Port Blair).

DIADEMA BOLINA, Linn. S. N. i. 2, p. 781; Clerck, Icon. t. 21. f. 2.

S. Andamans (Port Blair).

DIADEMA JACINTHA, Drury, Ill. Exot. Ent. ii. pl. 21. f. 1, 2 (1773); Donov. Ins. China, pl. 33. f. 1.

S. Andamans (Port Blair); Nicobars (Tillangshong).

HERONA ANDAMANA, n. sp.

Male and Female. Differs from *H. marathus* in the wings being more falcated. On the upperside the colour is much darker, the markings are narrower, paler on the fore wing in the male, and white on both wings in the female. On the fore wing in both sexes the markings beyond the cell are elongated and pointed at the ends; on the hind wing the discal band is broken up into spots, and the marginal band from the anal angle is composed of lunules in the male and of large indistinct lunular spots in the female. On the underside the markings are also whiter in the male, and in the female white throughout.

Expanse 3 inches.

S. Andamans (Port Blair). In coll. W. Distant and F. Moore.

PARTHENOS GAMBRISIUS, Fabr. Ent. Syst. iii. 1, p. 85; Donov. Ins. China, pl. 38; Doubleday & Hewits. Gen. D. Lep. pl. 51. f. 2.

S. Andamans (Port Blair).

LIMENITIS ANARTA, n. sp.

Male. Darker than the Indian form of *L. procris*. Differs in the narrower white maculated band on both wings, smaller subapical costal spots, and much smaller spot at end of the cell. The outer black markings are also broader; the marginal black dentate lunules are confluent and similar to those in *L. calidasa*.

Expanse $2\frac{4}{5}$ inches.

S. Andamans (Port Blair). In coll. F. Moore.

NEPTIS CNACALIS, Hewitson, Ann. Nat. Hist. 1874, xiv. p. 357.

S. Andamans (Port Blair).

NEPTIS ANDAMANA, n. sp.

Male and female. Upperside black: fore wing with a prominent white broad cell-streak and dentate spot beyond, a curved transverse discal series of widely separated spots, and two marginal rows of pale lunules, the outer row most distinct: hind wing with a white subbasal band, somewhat irregular, bordered and crossed by the veins; a submarginal row of whitish lunules; and a very indistinct pale median and submarginal line. Underside dusky ferruginous, markings as above, including a basal and subbasal streak, all very prominent and with black margins.

Expanse, ♂ 2, ♀ $2\frac{3}{8}$ inches.

S. Andamans (Port Blair). In coll. F. Moore.

NEPTIS MANANDA, n. sp. (Plate LVIII. fig. 4 ♀.)

Male and Female. Upperside black: fore wing with narrow dusky-white cell-streak and elongated pointed streak beyond; a discal curved transverse series of small white spots and two marginal rows of indistinct pale lunules; hind wing with broad white subbasal band, an indistinct pale brown submarginal narrow line, and a less distinct medial and marginal line. Underside dark chestnut-brown, markings as above, prominent, and purplish-white, including a narrow basal and subbasal streak on hind wing.

Expanse, ♂ $1\frac{7}{8}$, ♀ $2\frac{3}{8}$ inches.

S. Andamans (Port Blair). In coll. F. Moore.

NEPTIS NICOBARICA, n. sp.

Male and Female. Nearest allied to *N. varmona*, markings similar; discal series on fore wing less curved, thus giving a wider marginal space; the marginal row of lunular spots very prominent: on the hind wing the outer or discal series of spots are smaller, and terminate more towards anal angle; the marginal lunular line distinct. Underside also similar, the marginal markings broader.

Expanse, ♂ $1\frac{7}{8}$, ♀ $2\frac{1}{8}$ inches.

Nicobars, Kamorta (April). In coll. R. Meldola and F. Moore.

This is a different species from the allied Malayan *N. mamuja*, Butler, from Malacca.

TANAËCIA CIBARITIS (*Adolias cib.*), Hewitson, Ann. N. H. 1874, xiv. p. 358; id. Exot. Butt. v. *Adol.* pl. 4. f. 12, 13, 15.

S. Andamans (Port Blair).

TANAËCIA ACONTIUS (*Adol. acont.*), Hewitson, Ann. N. H. 1874, xiv. p. 357; id. Exot. Butt. v. *Adol.* pl. 4. f. 11.

S. Andamans (Port Blair).

SYMPHÆDRA TEUTOÏDES, n. sp.

From *S teuta* this form differs above in the male having the

maculated band more erect and the lower spots smaller; the band on the hind wing is also straighter, more evenly bordered on the inner edge, and regularly sinuous on its outer edge. The female on the fore wing has the band continuous and less broken up into spots; it is also broader at the costal end; the band on the hind wing, as in the male, is also more evenly edged within and regularly sinuous without. On the underside both sexes are much paler, are suffused with lilac exteriorly, and have no red in the discoidal marks.

Expanse, ♂ $2\frac{4}{8}$, ♀ $3\frac{2}{8}$ inches.

S. Andamans. In coll. F. Moore and H. Druce.

Fam. Lemoniidæ.

Abisara kausambi, Feld. Wien. ent. Monats. iv. p. 397 (1860).

S. Andamans (Port Blair).

Abisara bifasciata, n. sp. (Plate LVIII. fig. 2, ♀.)

From the Malayan *A. kausambi* this differs on the upperside in the discal transverse bands being sinuous; and in the female these are prominent. The two bands on the fore wing of the female are separated and broadly white anteriorly; the upper and lower spots on the hind wing are also larger. On the underside the bands are broader and sinuous, and on the hind wing there are but two anterior spots instead of three.

Expanse, ♂ $1\frac{6}{8}$, ♀ $1\frac{7}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

Fam. Lycænidæ.

Curetis saronis, n. sp.

Male and Female. Nearest allied to *C. insularis* of Java, but smaller, the fore wing on the upperside of the male having the black border less angulated on its inner margin; the underside of both wings is white with slight dusky undulated lines, *C. insularis* being cream-coloured and with rather prominent undulated lines. Female dark brown, with golden-yellow disk.

Expanse $1\frac{3}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore and H. Druce.

Pithecops hylax, Fabr. Syst. Ent. p. 526 (1775); Horsf. Catal. Lep. p. 66, pl. 1. f. 2; Butler, Catal. Fabr. Lep. B. M. p. 161.

S. Andamans (Port Blair).

Castalius ethion (*Lycæna eth.*), Hewitson; Doubleday & Hewits. Gen. D. Lep. pl. 76. f. 3; iid. Exot. Butt. v. *Lyc.* pl. i. f. 5.

Castalius elna (*Lyc. el.*), Hewits. Exot. Butt. v. *Lyc.* pl. i. f. 8.

S. Andamans (Port Blair).

Castalius manluena (*Lyc. man.*), Felder, Verh. zool.-bot. Ges. 1862, p. 484.

Nicobars (Kondul).

LAMPIDES ÆLIANUS, Fabr. Ent. Syst. iii. p. 280; Butler, Catal. Fabr. Lep. B. M. p. 166.

S. Andamans (Port Blair).

LAMPIDES CNEJUS, Fabr. Ent. Syst. Suppl. p. 430; Butler, *l. c.* p. 165.

Nicobars (Kamorta); April, *Meldola*.

LAMPIDES PANDAVA, Horsf. Catal. Lep. E.I. C. p. 84 (1829).

Nicobars (Nankowry and Kamorta); April, *Meldola*.

LAMPIDES STRABO, Fabr. Ent. Syst. iii. p. 287 (1793); Butler, Catal. Fabr. Lep. B. M. p. 165.

Lycæna kandarpa, Horsf. Catal. Lep. E.I. C. p. 82.
Lycæna asoka, Kollar, Hügel's Kaschm. iv. p. 419.
S. Andamans (Port Blair).

LAMPIDES KINKURKA, Felder, Verh. zool.-bot. Ges. 1862, p. 481; Novara-Reise, Lep. ii. p. 273, pl. 34. f. 24, 25.

Nicobars (Kar Nicobar and Nankowry), *Meldola*, April.

LAMPIDES KANKENA, Felder, Verh. zool.-bot. Ges. 1862, p. 481, Novara-Reise, Lep. ii. p. 270, pl. 34. f. 37.

Nicobars (Kar Nicobar).

LAMPIDES KONDULANA, Feld. Verh. zool.-bot. Ges. 1862, p. 484; Novara-Reise, Lep. ii. p. 271, pl. 34. f. 6.

Nicobars (Kondul); S. Andamans (Port Blair).

LYMPIDES MACROPHTHALMA, Felder, Verh. zool.-bot. Ges. 1862, p. 483; Novara-Reise, Lep. ii. p. 275, pl. 34. f. 35.

Nicobars (Pulo Milo).

POLYOMMATUS SANGRA, Moore, P. Z. S. 1865, p. 772, pl. 41. f. 8.

S. Andamans (Port Blair); Nicobars (Kamorta), April, *Meldola*.

APHNÆUS ZOILUS, n. sp.

Male. Upperside dark blue, black on outer borders; fore wing with transverse bands of black; hind wing with large, red, anal lobe, the black spots silver-speckled. Underside pale golden-yellow, bands jet-black, and traversed by a silver line: fore wing with seven transverse bands, a marginal line, and two short, basal, longitudinal streaks, the upper streak crossing the vein and touching the costal margin; the first and second transverse band near base of the cell, the first joining the upper and the second joining the lower basal longitudinal streak, third crossing end of cell towards posterior angle, fourth and fifth subapical and joined together, the other two marginal: hind wing with six bands and a marginal line, the first or basal broken and joining the third above the red anal spot, second entire and running into the first and third at its lower end, fourth

and fifth short, sixth narrow; a short streak also above anal angle; red anal lobe as above.

Expanse $1\frac{2}{8}$ inch.

S. Andamans. In coll. H. Druce and F. Moore.

Differs from typical *A. lohita* in its larger size, the different-coloured bands beneath, and the narrowness of the marginal band on the fore wing.

HYPOLYCÆNA ANDAMANA, n. sp.

Male. Upperside ultramarine blue; fore wing with a large black discal patch, abdominal margin dusky brown; cilia of hind wing grey, marginal anal streak and edge of tails white, anal lobe with a small reddish spot. Underside greyish blue; a brown discal transverse band on both wings, straight on fore wing, broken and zigzag on hind wing; a small black anal and a red-bordered black subanal spot.

Female. Upperside brown; both wings with an indistinct median transverse curved darker band; hind wing with white marginal outer line, discal lunular marks, and three black spots from anal angle, the first golden-speckled. Underside as in male, but slightly paler greyish blue. Allied to *H. erylus*.

Expanse, ♂ $1\frac{2}{8}$, ♀ $1\frac{3}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

HYPOLYCÆNA ELTOLA, Hewitson, Ill. D. Lep. Suppl. p. 14, pl. 5. f. 37, 38 (1869).

S. Andamans (Port Blair).

SITHON ARECA (*Myrina a.*), Felder, Verh. zool.-bot. Ges. 1862, p. 481.

Nicobars (Kar Nicobar).

SITHON KAMORTA (*Myr. k.*) Felder, *l. c.* p. 485.

Nicobars (Sambelong).

DEUDORIX ORSEIS, Hewitson, Ill. D. Lep. p. 23, no. 20 (1863).

Nicobars (Kamorta), April, *Meldola*.

DEUDORIX EPIJARBAS, Moore, Catal. Lep. E.I.C. i. p. 32 (1857); Hewit's Ill. D. Lep. pl. 7. f. 16–18.

S. Andamans (Port Blair).

MYRINA PRABHA, n. sp. (Plate LVIII. fig. 5 ♀.)

Male. Upperside red: fore wing with black apical band; base of wing and costa dusky rufous-brown: hind wing with blackish costal border, subcostal veins, and narrow border on outer margin; abdominal margin dusky rufous-brown.

Female. Upperside red: fore wing with a broad black apical band and dusky rufous-brown base: hind wing dark rufous-brown; discal

veinlet, median and internal veins, and tail streaked with red, tip of tail white: body black above, white beneath; palpi and legs white-speckled. Underside ochreous yellow, with two outer indistinct rows of small brownish spots on fore wing, and two indistinct bands on hind wing, a speckled black-and-white mark at angle of tail.

Expanse, ♂ $1\frac{2}{5}$, ♀ $1\frac{4}{5}$ inch.

S. Andamans (Port Blair). In coll. F. Moore and H. Druce.

Quite a differently marked insect from its ally *Myr. atymnus*, Cram.

Amblypodia zeta, n. sp. (Plate LVIII. fig. 6, ♀.)

Female. Upperside brilliant cobalt-blue, apex and outer borders broadly black. Underside light umber brown; fore wing with two pale-bordered darker spots within the cell, two beyond, and a discal row of five spots; hind wing with two basal rows each of four pale-bordered darker spots, a discal duplex series of similar spots, and two marginal rows of pale-bordered dentate marks.

Expanse $1\frac{1}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

Amblypodia nakula, Felder, Wien. ent. Monat. iv. p. 395 (1860); Novara-Reise, Lep. ii. p. 222, pl. 29. f. 16.

S. Andamans (Port Blair).

Fam. Pieridæ.

Terias formosa, Hübn. Zutr. Ex. Schmett. f. 979 (1837).

S. Andamans (Port Blair).

Terias nicobariensis, Felder, Verh. zool.-bot. Ges. 1862, p. 480.

Nicobars (Kar Nicobar, Kamorta and Nankowry), April, *Meldola*.

S. Andamans (Port Blair).

Hebomoia glaucippe, Linn. S. N. i. 2, p. 762; Drury, Ill. Exot. Ins. i. pl. 10. f. 1.

S. Andamans (Port Blair).

Ixias andamana, n. sp.

Male. Upperside pale primrose-yellow, decreasing basally to yellowish white: fore wing with the apical portion brownish-black, subapical band ochreous red, and slightly recurved hindward and outward, and irregularly margined inwardly, its borders being also minutely black-speckled: hind wing with speckled bordered black marginal band, and a few speckles at its base. Underside bright gamboge-yellow: fore wing with a broad black-speckled spot at end of the cell; a recurved submarginal series of speckled spots ending in a black patch at angle: hind wing with a round costal brown-speckled spot, three anterior submarginal spots followed by indistinct smaller spots; a black dot at end of the cell, and a dot at end of each vein on outer margin.

Female. Differs in the fore wing from the male in having the yellow portion confined to the middle of the wing below the cell, the ochreous red band being narrow and broken by the upper median vein; the band on the hind wing is also broader: on the underside the yellow is of a deeper tint, and the markings darker and broader; the outer margins with minute black speckles and narrow strigæ.

Expanse, ♂ $2\frac{2}{5}$, ♀ $2\frac{3}{5}$ inches.

S. Andamans. In coll. F. Moore.

Appias galathea, Feld. Verh. zool.-bot. Ges. 1862, p. 485; Novara-Reise, p. 165.

Nicobars (Sambelong).

Catopsilia catilla, Cram. Pap. Exot. iii. pl. 229, f. D, E, ♀ (1782); Butler, Lep. Exot. p. 24, pl. 9. f. 7–10.

Pieris hilaria, Cram. pl. 339. f. A, B, ♂.

S. Andamans (Port Blair).

Catopsilia crocale, Cram. Pap. Exot. i. pl. 55, f. C, D (1779); Butler, Lep. Exot. pl. 9. f. 1, 2.

S. Andamans (Port Blair); Nicobars (Kamorta), April, *Meldola*.

Catopsilia chryseis, Drury, Ill. Exot. Ent. i. pl. 12. f. 3, 4 (1773); Butler, *l. c.* pl. 15. f. 4–7.

S. Andamans (Port Blair).

Pieris nama, Moore, Catal. Lep. E.I.C. i. p. 76; P. Z. S. 1857, p. 102, pl. 44. f. 1, 2; Hewits. Exot. Butt. *Pieridæ*, pl. 6. f. 37.

S. Andamans (Port Blair).

Pieris lichenosa, n. sp.

Allied to *P. coronis* (Cram. pl. 44. f. B, C): differs on the upperside in the veins being black-lined, the apex of fore wing more evenly white-speckled between the veins, the hind wing having a well-formed marginal band. The underside is much darker green, and is densely covered with black speckles, giving the wings a mossy appearance.

Expanse $2\frac{4}{5}$ inches.

S. Andamans. In coll. F. Moore.

Eronia naraka, n. sp.

Nearest to *E. pingasa* of S. India; both wings in the male with similar broad black outer border and widened veins, but without the black streak within the cell: the fore wing also has two additional small blue costal spots above the discal series, and a small white spot near the apex. In the female the markings are narrower, shorter, and the marginal spots much smaller.

Expanse 3 inches.

S. Andamans (Port Blair). In coll. F. Moore and H. Druce.

Fam. PAPILIONIDÆ.

ORNITHOPTERA HELICONOIDES, n. sp.

Male. Upperside—fore wing entirely black: hind wing golden yellow, with black abdominal fold and, longitudinally from base of submedian to middle of lower median veinlet, a marginal band formed by a series of six conical spots decreasing in size from anal angle, the first or anal elongated at its apex, the second, third, fifth and sixth each with a contiguous small upper round spot; the space at base of wing broadly across end of cell to middle of costal vein also black. Underside as above; fore wing very slightly grey-streaked along base of lower median veinlets.

Female. Fore wing with prominent greyish-white streaks along the veins, and similar streaks within end of the cell: hind wing with black abdominal fold, a partly constricted elongated spot above anal angle, outer marginal band of large continuous cones, a discal series of five small spots, the space at base of wing occupying the interspace between the costal and subcostal to near its end. Underside as above. Abdomen greenish black above, yellow at sides and beneath. Red collar slightly perceptible in female.

Expanse, ♂ 5⅝, ♀ 6¼ inches.

S. Andamans (Port Blair). In coll. H. Druce.

PAPILIO MAYO, Atkinson, P. Z. S. 1873, p. 736, pl. lxiii. f. 1.

S. Andamans (Port Blair).

PAPILIO CHARICLES, Hewitson, Ann. Nat. Hist. 1874, xiv. p. 356; Exot. Butt. v. *Pap.* pl. xiv. f. 45, ♀.

S. Andamans (Port Blair).

PAPILIO RHODIFER, Butler, Ent. Monthly Mag. 1876, p. 57, ♀.

S. Andamans (Port Blair).

PAPILIO ARISTOLOCHIÆ, var. CAMORTA.

Female. Differs from Indian and Malayan forms of *P. aristolochiæ* on the upperside of the hind wing in the absence of the discal markings, the only indication of these in the Nicobar form being a slight pale speckled streak at the junction of the two lower median veinlets and an upward elongation of the reddish anal spot. On the underside these are slightly more prominent.

Expanse 3¼ inches.

Nicobars (Kamorta), April 6, 1875. In coll. R. Meldola and F. Moore.

PAPILIO PAMMON, var. NICOBARUS, Feld. Verh. zool.-bot. Gesch. 1862, p. 483.

Nicobars (Nancowry, Kamorta), and S. Andamans (Port Blair), *Meldola*, April.

PAPILIO AGAMEMNON, Linn. S. N. ii. p. 748; Donov. Ins. China, t. 27. f. 2.

S. Andamans (Port Blair); Nicobars (Kamorta), April, *Meldola*.

Papilio eurypylus (?), Linn. S. N. ii. p. 754; Cram. Pap. Exot. ii. pl. 122, f. C, D.

? *Axion*, Feld.

S. Andamans (Port Blair).

Papilio antiphates, Cram. Pap. Exot. i. pl. 72, f. A, B.

S. Andamans (Port Blair).

Fam. Hesperidæ.

Ismene chromus, Cram. Pap. Exot. iii. pl. 284, f. E (1782).

S. Andamans (Port Blair).

Ismene malayana, Felder, Wien. ent. Monat. iv. p. 401 (1860); Novara-Reise, Lep. iii. pl. 72. f. 15.

S. Andamans (Port Blair).

Tagiades alica, n. sp. (Plate LVIII. fig. 11, ♂.)

Male. Allied to *T. obscurus*, Mabille, from Java, but of a blacker colour, the fore wing being more pointed, the hind wing more produced at the anal angle. Markings above similar; on the underside the hind wing has more prominent black discal marks, and a much broader black border on the grey portion of the outer margin.

Expanse $1\frac{7}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

Tagiades helferi (*Pteryg. h.*), Felder, Verh. zool.-bot. Ges. p. 483 (1862).

Nicobars (Pulo Milu).

Plesioneura alysos, Moore, P. Z. S. 1865, p. 789.

S. Andamans (Port Blair).

Hesperia cahira, n. sp. (Plate LVIII. fig. 8.)

Male and female. Upperside dark rufous-brown, suffused with olive-brown at the base. *Male*. Fore wing with two small yellow spots at end of the cell, two on the disk, and two very small spots before the apex. *Female*, with a series of three small spots before the apex and another spot of the same size between them and the two on the disk; cilia of hind wing yellowish cinereous.

Underside of male rufous-brown; female olive-brown, with a pale greyish streak on middle of hind margin.

Expanse, ♂ $1\frac{5}{8}$, ♀ $1\frac{6}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

Near to *H. oceia*, Hewits.; differs in the male above in the absence of the basal tuft of hairs on the hind wing, and beneath also in the absence of the prominent and large white patch and its central spot on the fore wing.

Hesperia oceia, Hewits. Desc. Hesp. p. 31 (1868).

S. Andamans (Port Blair).

HESPERIA COLACA, n. sp. (Plate LVIII. fig. 7.)

Male and female. Dark olive-brown; cilia cinereous: fore wing with a recurved discal series of seven small yellow spots, the second from the hind margin being the largest; a small spot also at end of the cell. Underside brown, apex and hind wing speckled with olive-green scales; a median discal series of small spots on hind wing. Near to *H. cinnara*.

Expanse, ♂ $1\frac{2}{10}$, ♀ $1\frac{3}{10}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

HESPERIA BETURIA, Hewitson, Desc. Hesp. p. 36 (1868).

S. Andamans (Port Blair).

HESPERIA MATHIAS, Fabr. Ent. Syst. Supp. p. 433 (1798); Butler, Catal. Fabr. Lep. B. M. p. 275, pl. 3. f. 8.

Nicobars (Kamorta), April, *Meldola*.

TELEGONUS THYRSIS, Fabr. Syst. Ent. p. 532 (1775).

H. pandia, Moore, P. Z. S. 1865, p. 790.

S. Andamans (Port Blair).

PAMPHILA PURREEA, n. sp. (Plate LVIII. fig. 10.)

Upperside blackish brown; cilia yellow, slightly alternated with black; fore wing with a gamboge-yellow basal streak, and a median oblique irregular band commencing from near apex, extending to hind margin and terminating at its base; hind wing with a short median yellow wavy band. Underside sulphur-yellow; fore wing with a broad dark-brown basal streak, a small spot at end of cell, and a large patch at posterior angle; hind wing with a brown speckled streak along inner margin, terminating broadly at anal angle. Body above brown, head and thorax interspersed with yellow hairs; abdomen narrowly banded with yellow; palpi black above, yellow below. Legs and body beneath yellow.

Expanse $1\frac{1}{8}$ inch.

S. Andamans (Port Blair). In coll. W. C. Hewitson and F. M.

PAMPHILA GOLA, n. sp. (Plate LVIII. fig. 9, ♂.)

Male. Upperside dark vinous-brown; fore wing with an oblique discal irregular sinuous-bordered golden-yellow band, the band bent before the apex and indented at end of the cell; hind wing with a median discal golden-yellow band, and a few hairs of the same colour at the base; cilia edged with golden yellow. Front of head, palpi, and legs golden yellow. Underside with the bands as above; costa and apex of fore wing and the hind wing suffused with yellow; both wings with a blackish streak at end of the cell.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. F. Moore.

PAMPHILA MESOIDES, Butler, Trans. Linn. Soc. 1877.

S. Andamans, Port Blair.

Tribe Sphinges.

Fam. Sphingidæ.

Pergesa acteus, Cram. Pap. Exot. iii. pl. 248. f. A (1782).
S. Andamans (Port Blair).

Panacra busiris, Walker, Catal. Lep. Het. B. M. viii. p. 158 (1856).
S. Andamans (Port Blair).

Acherontia morta, Hübner; Cram. Pap. Exot. iii. pl. 237. f. A.
A. satanas, Boisd. Hist. N. des Lép. pl. 16. f. 1.
A. lethe, Westw. Cab. Orient. Ent. p. 87, pl. 42. f. 2.
(?) *Sphinx lachesis*, Fabr. Ent. Syst. Suppl. p. 434.
S. Andamans (Port Blair).

Chærocampa nessus, Drury, Ill. Nat. Hist. ii. p. 46, pl. 27. f. 1 (1773).
S. Andamans (Port Blair).

Chærocampa tenebrosa, n. sp.

Upperside—fore wing dark buff-brown, with six oblique discal indistinct dusky bands, the fourth black-streaked where crossing the veins; a black spot near base and one at end of the cell; hind wing dark fuliginous-brown, palest at anal angle; thorax dark buff-brown; abdomen dusky brown above. Underside—fore wing dusky brown; discal oblique band reddish buff, slightly black-speckled, and with black spot on each vein: hind wing reddish buff, slightly black-speckled, with a discal series of black spots: abdomen beneath and legs pale buff-brown.

Expanse 3 inches.

S. Andamans (Port Blair). In coll. British Museum.

Allied to *C. lucasi*, Walk., but is a much darker insect.

Triptogon andamana, n. sp.

Male. Nearest allied to *T. fuscescens*, Butler, but differs above on the fore wing in the median and subbasal transverse bands being bent and terminating on the hind margin more obliquely inwards, the basal bands each being waved, and the dark chestnut-brown spots near posterior angle smaller; hind wing less lobed and browner at anal angle, the spots smaller, and basal streaks not so prominent; and on the underside the inner dusky band on hind wing is curved.

Expanse 4 inches.

S. Andamans (Port Blair). In coll. British Museum.

Clanis phalaris, Cram. Pap. Exot. ii. p. 83, pl. 149. f. A (1779).
Sphinx pagana, Fabr. Spec. Ins. ii. p. 146 (1781).
Sph. nicobarensis, Schwartz, Beyt. Suppl. à Klem. et Rœs. i. 1; Esper, Schmett. App. pl. 1. f. 1.
Clanis nicobarensis, Hübn. Verz. p. 138.
S. Andamans (Port Blair).

CALYMNIA PAVONICA, n. sp.

Similar to *C. panopus*, but differs from both Java and Indian specimens in its much darker colours, the fore wing having the basal band broken up and not continued obliquely onto the costa; between this and the discal band are two distinctly separated median, dusky, wavy bands: in the hind wing the markings are very black and with a distinct median broad fascia; the basal space red: thorax brown-black; abdomen very dark fawn-colour, apical segments only fringed with black.

Expanse 5 inches.

S. Andamans (Port Blair). In coll. British Museum.

PROTOPARCE ORIENTALIS, Butler, Trans. Zool. Soc. ix. p. 609 (1876).

Sphinx convolvuli, Moore, Catal. Lep. E.I. C. i. p. 267.

S. Andamans (Port Blair).

Tribe BOMBYCES.

Fam. AGARISTIDÆ.

EUSEMIA ALBOMARGINATA, Moore, P. Z. S. 1872, p. 569.

S. Andamans (Port Blair).

Fam. ZYGÆNIDÆ.

Subfam. THYRETINÆ.

ERESSA AFFINIS, n. sp. (Plate LIX. fig. 3.)

Allied to *E. confinis*, Walk. Transparent markings of fore wing similar, but more rounded, the spot within the cell smaller; space on hind wing confined to a median rounded spot beyond the cell, and crossed only by a single vein.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. F. Moore.

Obtained also from the district of Calcutta and the Khasia hills by the late W. S. Atkinson, Esq.

Subfam. EUCHROMIINÆ.

EUCHROMIA POLYMENA, Linn. S. N.; Cram. Pap. Exot. i. pl. 31. f. D.

S. Andamans (Port Blair).

Fam. ARCTIIDÆ.

ALPENUS BISERIATUS, n. sp.

Pale orange-red, brightest on hind wing; fore wing with two transverse median recurved series of blackish spots, and two intermediate spots at end of the cell; some smaller spots at base of wing; hind wing with a black spot at end of the cell and at anal angle.

Body bright red, with black dorsal bands and yellow anal tuft. Palpi black at tip. Legs yellow; fore legs black-streaked.

Expanse $1\frac{3}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Allied to *A.* (*Spilosoma*) *maculifascia*, Walk., from Java.

Fam. Lithosiidæ.

Sesapa andamana, n. sp.

Allied to *S. undulosa*, Walk.

Pale buff-yellow; fore wing with a purplish-black transverse, central recurved band, some irregularly disposed spots at base, a spot at end of the cell, an outer sinuous band, and a maculated marginal line. Underside dusky yellow on fore wing. Antennæ, palpi, and legs brownish.

Expanse $\frac{8}{10}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Lithosia intermixta, Walk. Catal. Lep. Het. B. M. Suppl. p. 229.

S. Andamans (Port Blair).

Lithosia antica, Walk. Catal. Lep. Het. B. M. ii. p. 505.

S. Andamans (Port Blair).

Barsine trivittata, n. sp.

Male. Upperside—fore wing red, with black subbasal outwardly angled band, a median recurved band, and outer zigzag band; costa at apex and cilia black: hind wing pale red; cilia at apex blackish. Body, antennæ, and legs red. Underside—fore wing bright red, speckles at apex and cilia black; hind wing yellowish, speckles at apex blackish.

Expanse $1\frac{1}{2}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Bizone amabilis, n. sp. (Plate LIX. fig. 2, ♂.)

White: fore wing with four transverse crimson bands, male with confluent crimson spots, and female with a single spot at end of the cell; hind wing pale yellow, suffused with crimson externally. Underside pale crimson, whitish at base, bands slightly apparent. Antennæ, palpi, and spots on thorax crimson. Legs crimson, whitish beneath.

Expanse $\frac{8}{10}$ inch.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

Argina cribraria, Cram. Pap. Exot. iii. pl. 208. f. C; Clerck, Icones, pl. 54. f. 4.

S. Andamans (Port Blair), Nicobars (Kamorta), April, *Meldola*.

Fam. Hypsidæ.

Peridrome orbicularis, Walk. Catal. Lep. Het. B. M. ii. p. 445 (1854).

Aganopis subquadrata, H.-Schäff. Lep. Sp. Nov. p. 70, f. 501 (1856).

S. Andamans (Port Blair).

Euplocia membliaria, Cram. Pap. Exot. iii. p. 269. f. C, D.

S. Andamans (Port Blair).

Damalis alciphron, Cram. Pap. Exot. ii. pl. 133. f. E.

S. Andamans (Port Blair).

Hypsa andamana, n. sp. (Plate LIX. fig. 5.)

Allied to *H. egens* from N. India.

Upperside much brighter ochreous: fore wing with a series of six basal black spots, two of which are within the cell; prominent ochreous-brown streaks between the veins, which form two partly confluent, transverse, irregular, median and outer bands. Underside—fore wing with a broad lunular black spot at end, and a large round spot in the middle of the cell; the hind wing has a small black spot at end of the cell on upper discocellular, and a small lunular spot above the end of the cell.

Expanse $2\frac{4}{5}$ inches.

S. Andamans (Port Blair). In coll. F. Moore.

Hypsa venalba, n. sp.

Female. Upperside cinereous-black; base of fore wing and abdomen ochreous-yellow: fore wing with a broad white longitudinal dilated streak; some black spots at the base; veins narrowly lined with white to near outer margin; a white spot at upper end of the cell: hind wing white, with a broad black marginal band, and narrow spot at end of the cell; cilia white. Thorax with black spot on tegulæ, streak down middle, and a dorsal and lateral row of spots on abdomen. Antennæ black. Palpi ochry-yellow, first and second joints with a spot on outer side, and the entire third joint black. Legs black, streaked with grey.

Expanse $2\frac{1}{10}$ inches.

S. Andamans (Port Blair). In coll. British Museum.

This species is nearest allied to *H. dama*.

Philona cinerascens, n. sp. (Plate LIX. fig. 6.)

Differs from *P. inops* in the fore wing being of a much darker cinereous colour, and the veins more prominently lined with white; the hind wing is white, the marginal band greyish-black and broader, and continued broadly along anterior margin on both upper and undersides; the fore wing beneath and the band on the hind wing are very dark fuliginous black, with a blacker median curved streak on fore wing, the space beneath the streak and the lower basal space of hind wing being white.

Expanse 2⅛ inches.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

Fam. Callidulidæ.

Cleosiris catamita, Geyer, Hübn. Zutr. f. 653, 654.

S. Andamans (Port Blair).

Fam. Nyctemeridæ.

Nyctemera lacticinia, Cram. Pap. Exot. ii. pl. 128. f. E.

S. Andamans (Port Blair).

Pitasila, n. g.

Fore wing short, rather broad, costa slightly arched, apex angled, outer margin short, oblique, hind margin straight; subcostal vein five-branched, third, fourth, and fifth on a short foot-stalk from end of cell; first and third discocellulars very short, second bent inward; one radial from lower angle of upper discocellular; median vein four-branched, first and second starting from angles of lower discocellular, third contiguous, fourth at half length of cell; one submedian. Hind wing trigonal, apex rounded, exterior margin convex in the middle; subcostal vein two-branched, disposed as in fore wing; one submedian. Body short, attenuate in male. Antennæ slender, bipectinated in male to tip, minutely pectinated in female. Palpi porrect, third joint cylindrical. Legs naked.

Pitasila leucospilota, n. sp. (Plate LIX. fig. 7.)

Male and female. Fore wing with a series of four white spots from base of costa, the third largest, also two within the cell, three larger spots below the cell and confluent on hind margin, the lower basal enclosing a black spot, and the third two spots, one above the other in male, confluent in female; two spots also before the apex: hind wing with a broad black marginal band, on which are two small white spots, one near angle, the other on middle of margin; a small black spot at upper end of cell and two above it on margin; cilia white, at apical angle of hind wing. Underside as above. Head and thorax yellow; abdomen white, with yellow tip; black spots on head and thorax, also dorsal and lateral row on abdomen; antennæ black; legs white, streaked with black.

Expanse, ♂ 1¾, ♀ 2 inches.

S. Andamans (Port Blair). In coll. Brit. Mus. and F. Moore.

Allied to *P. maculosum*, Feld. Nov.-Reise, pl. 103. f. 2, to *P. variolosa*, Feld. ib. pl. 129. f. 15, and also to *P. varians*, Walk.

Fam. Euschemidæ.

Euschema andamana, n. sp.

Male and female. Upperside purple-black, both wings with the outer margin and discal spots darker purple-black: fore wing with a broad subbasal bright yellow band, which is irregularly margined and

narrowest on hind margin; a short subapical transverse row of decreasing purplish white spots. Abdomen golden yellow in male, in female purple-black beneath and with a dorsal row of black spots. Palpi and legs cinereous. Underside as above; discal black spots more prominent: hind wing with a small yellow basal streak and also a streak above the cell.

Expanse $2\frac{6}{10}$ inches.

S. Andamans (Port Blair). In coll. Brit. Mus. and F. Moore.

Nearest allied to *E. auristriga*, Walk., and to *E. bernsteini*, Feld.

E. RŒPSTORFFI, n. sp.

Allied to *E. bellona*, Walk.

Male. Smaller in size, differs on fore wing in having the basal black markings formed into prominent bands instead of being composed of separate spots; the purplish white discal band is nearer the apex, broader, and more prominent: on the hind wing the black spots are larger, and there is also a distinct purplish white discal maculated band crossing the broad black margin.

Expanse $2\frac{4}{10}$ to $2\frac{8}{10}$ inches.

S. Andamans (Port Blair). In coll. British Museum.

CELERENA ANDAMANA, Feld. Nov.-Reise, Lep. iv. pl. 130. f. 18 (1875).

S. Andamans (Port Blair).

Fam. CHALCOSIIDÆ.

CYCLOSIA NIGRESCENS, n. sp.

Female. Differs from *C. papalionaria* from Sikkim and Silhet in the fore wings being more acute at the apex, having broader pale yellow interspaces between the veins, and in the marginal row of spots being almost obsolete; the hind wing has a simple band with a marginal row of very indistinct small pale spots.

Expanse 3 inches.

S. Andamans (Port Blair). In coll. British Museum.

Fam. LIPARIDÆ.

REDOA FLAVESCENS, n. sp.

Male. Yellowish white; front of head brown. Antennæ pale brown, shafts white. Upperside with glittering silvery scales, exterior margins slightly fawn-coloured. Palpi white, brown at tip. Legs whitish.

Expanse $1\frac{2}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

REDOA SERICEA, n. sp.

Male. Pure white; front of head brown. Antennæ pale brown, shafts white. Upperside covered with glittering silvery white scales; costa of fore wing ochreous; a black dot at end of the cell; exterior

margins and cilia of both wings fawn-colour. Legs white, fore and mid legs with black bands. Palpi pale brown, tipped with black.

Expanse $1\frac{1}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

CAVIRIA CYGNA, n. sp.

Female white: fore wing silky white, with indistinctly apparent raised oblique bands: hind wing not silky. Palpi and fore legs ochry yellow, middle and hind tarsi pale ochry yellow.

Expanse $1\frac{5}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

LÆLIA VENOSA, n. sp. (Plate LIX. fig. 1, ♂.)

Male. Upperside pale ochreous brown. Veins of fore wing and cilia of both wings ochreous white. Front of thorax, head, palpi, and abdomen ochreous yellow; thorax above greyish. Underside paler.

Expanse $1\frac{5}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

EUPROCTIS DISCINOTA, n. sp.

Upperside bright ochry yellow: fore wing with two median transverse dark chestnut-brown speckled bands, the outer band recurved and crossed by pale veins; a black spot at end of cell. Underside paler, both wings with an indistinct darker ochry transverse fascia, and a black spot at the end of the cell.

Expanse $1\frac{5}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Fam. PSYCHIDÆ.

MAHASENA, n. g.

Fore wing elongated, narrow, costa straight, apex rounded, exterior margin oblique, posterior margin convex in the middle; costal vein moderately stout; subcostal slender, four-branched, first and second branches arising before end of the cell, third at end of the cell, fourth from below the third at two thirds its length and terminating below the apex; discoidal cell broad at its end; upper discocellular vein long, inwardly oblique and bent outward at its middle; lower discocellular short, outwardly oblique, and emitting within the cell a discoidal veinlet at each end, which are joined together at two thirds their length, the end extending inwards towards base of the cell; upper radial arising from end of the cell, lower radial from angle of upper discocellular, both nearly straight; median vein moderately stout, short and twice bent at its end, four-branched, the two lower arising from the angles at its end, the third from end of the cell, and fourth at one third from base of the latter; submedian curved and bent below end of the cell, and thence extending straight to posterior angle, emitting a lower branch or internal veinlet at the angle, the lower branch being forked at half its length and extending to near base of the wing. Hind wing short, broad, trigonal, anterior

margin very convex; costal and subcostal parallel, extending to apex; cell broad, extending hindward towards outer margin; disco-cellulars nearly straight, outwardly oblique, emitting one radial from their middle; two discoidal veinlets within the cell, joined together at half their length and extending to near base of the cell; median vein long, its end bent nearly parallel with outer margin of wing, four-branched, the branches short, the two upper arising together at lower end of the cell, a straight submedian, and two internal veins. Body slender, abdomen attenuated, extending half its length beyond hind wings. Antennæ broadly bipectinated to tip. Legs slender, sparsely hairy; fore legs with long tibial spur.

MAHASENA ANDAMANA, n. sp. (Plate LIX. fig. 4, ♂.)

Male. Wings dark fuliginous brown, piceous towards the base. Body piceous, darkest on abdomen. Antennæ fuliginous brown. Legs brown.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. F. Moore.

Fam. SATURNIIDÆ.

ACTIAS IGNESCENS, n. sp.

Differs from *A. leto* from Sikkim in having broader wings, shorter tails, and larger ocelli, in the subbasal and outer fiery-red bands being broader and confluent, the transverse zigzag band in both wings being contiguous to and touching the ocellus. On the underside the markings are more prominent, the outer band broader, and the basal more sinuous.

Expanse 6 inches.

S. Andamans (Port Blair). In coll. British Museum.

ACTIAS SELENE, McLeay, Zool. Misc. (1815), pl. 70; Cram. Pap. Exot. pl. 31. f. A. B.

S. Andamans (Port Blair).

ANTHERÆA ANDAMANA, n. sp.

Female.—Upperside brownish-buff, base suffused with buff-yellow; ocelli small, ringed with black and yellow outwardly and red and white inwardly, talcose spot constricted: fore wing with transverse subbasal streaks, two discal lunular bands, and a nearly straight oblique outer band brown, the latter slightly bordered with dull red; costa and apex grey speckled with brown: hind wing with irregular subbasal streak, lunular median, and two wavy outer brown bands, the latter slightly tinged with red. Collar grey; thorax brown; abdomen and legs buff-brown; antennæ reddish brown. Underside greyish brown, inner bands brown, outer band of large triangular spots dark brown.

Expanse 7 inches.

S. Andamans (Port Blair). In coll. British Museum.

Tribe Noctues.

Fam. Leucanidæ.

Leucania costalis, n. sp. (Plate LIX. fig. 11.)

Male and female. Upperside cream-colour: fore wing sparsely irrorated with minute brown scales, crossed by two median indistinct blackish sinuous lines; a pale brown streak from base extending below and before the end of the cell, giving the appearance of a basal costal band; two spots within the cell, the inner largest; a marginal row of black dots: hind wing pale ochreous brown externally; veins darker. Underside paler; fore wing dusky brown in the middle; a marginal row of black dots on both wings. Palpi and legs speckled with black.

Expanse $1\frac{2}{8}$ inch.

S. Andamans. In coll. F. Moore.

This species also occurs at Darjiling and Malabar.

Fam. Glottulidæ.

Ramadasa, n. g.

Fore wing short, broad, costa slightly convex, apex truncated, exterior margin oblique hindward, posterior margin slightly lobed towards the base; costal vein short, ending at half the length of costa; cell broad; subcostal vein six-branched, first and second branches arising close together a little beyond half length of the cell, the third and sixth at end of cell, the third terminating before the apex, the fourth and fifth arising below from near the base of third and terminating at and below the apex, the sixth running parallel below the fifth; median vein three-branched, branches at equal distances from end of the cell, each recurved; discocellulars of equal length; one radial, slightly recurved; submedian vein running parallel and close to median and lower branch, terminating on exterior margin considerably above posterior angle; internal vein straight, terminating above the angle. Hind wing trigonal, short, exterior margin produced in the middle; abdominal margin straight; cell short; subcostal vein three-branched, first branch arising from half the length of the cell, second and third starting together at end of the cell; median vein three-branched, lower branch arising from an angle before end of the cell, second and third together at base from end of cell; upper discocellular long, lower short; one radial; submedian vein straight. Antennæ very long, filiform. Palpi short, clothed with short adpressed scales; second joint short, conical, ascending. Body moderately stout; abdomen tapering towards the apex, extending beyond hind wing. Legs long; tibia clothed above with longish hair; mid and hind tibiæ spurred.

Ramadasa pavo. (Plate LIX. fig. 8.)

Chasmina pavo, Walk. Cat. Lep. Het. B. M. part ix. p. 147.

S. Andamans. In coll. British Museum and F. Moore.

Fam. Apamidæ.

Spodoptera cilium, Guén. Noct. i. p. 156, ♂.

S. insulsa, Walk. Cat. Lep. Het. B. M. Suppl. p. 648, ♀.

S. Andamans (Port Blair).

Spodoptera nubes, Guén. Noct. i. p. 155.

P. infecta, Walk. *l. c.* ix. p. 196.

S. Andamans (Port Blair).

Prodenia ciligera, Guén. Noct. i. p. 164.

P. glaucistriga, Walk. *l. c.* ix. p. 197, ♀.

S. Andamans (Port Blair).

Illatia cephusalis, Walk. Cat. Lep. Het. B. M. xvi. p. 209 (1858).

Miana inornata, Walk. *l. c.* Suppl. p. 677.

S. Andamans (Port Blair).

Perigea canorufa, Walk. Cat. Lep. Het. B. M. Suppl. p. 683, ♂.

P. illecta, Walk. *l. c.* p. 684, ♀.

S. Andamans (Port Blair).

Thalpophila cuprea, n. sp. (Plate LIX. fig. 10.)

Upperside—fore wing dark cupreous brown, some narrow curved purple lines and black streaks at the base, an irregular recurved sinuous purple line with black inner border across the disk; two similar-coloured spots in the cell, and dentate streaks on outer margin, bordered with white before the apex: hind wing golden yellow, with broad cupreous brown outer band. Thorax, palpi, legs, and abdomen beneath cupreous brown. Abdomen golden yellow, tip and dorsal tuft reddish. Underside pale reddish brown, yellowish at base; both wings with indistinct outer sinuous brown line.

Expanse $1\frac{3}{8}$ inch.

Andamans. In coll. F. Moore.

Fam. Caradrinidæ.

Amyna selenampha, Guén. Noct. i. p. 406; Walk. Cat. Lep. Het. B. M. p. 1696.

Alamis spoliata, Walk. *l. c.* p. 1050.

S. Andamans (Port Blair).

Fam. Hamerosidæ.

Apsarasa figurata, n. sp.

Bluish black. Differs above in both sexes from *A. radians* from Sikkim in the fore wing having the smaller marginal spots of less size, in the large median spot on hind margin being broadest at its upper end, and in the hind wing having the white space confined to-

wards the anal angle. Abdomen black above and beneath, tip also black, has small lateral white spots only. On the underside the hind wing is marked at the base only with small spots, instead of distinct bands as in *A. radians*.

Expanse, ♂ 2⅝, ♀ 2⅞ inches.

S. Andamans. In coll. British Museum and F. Moore.

The type of the genus *Apsarasa* is *Glottula radians*, Westw. Orient. Ent. pl. 28. f. 4.

Fam. Acontidæ.

Xanthodes transversa, Guén. Noct. ii. p. 211; Walk. Cat. Lep. B. M. p. 778.

S. Andamans (Port Blair).

Acontia signifera, Walk. Cat. Lep. Het. B. M. xii. p. 793.

S. Andamans (Port Blair).

Fam. Palindidæ.

Homodes crocea. (Plate LX. fig. 3.)

Homodes crocea, Guén. Noct. ii. p. 280; Walk. Cat. Lep. Het. B. M. p. 853.

S. Andamans (Port Blair).

Fam. Eriopidæ.

Callopistria exotica, Guén. Noct. ii. p. 294; Walk. *l. c.* xii. p. 865.

S. Andamans (Port Blair).

Fam. Eurhipidæ.

Ingura cristatrix, Guén. Noct. ii. p. 313.

S. Andamans (Port Blair).

Fam. Plusiidæ.

Plusiodonta conducens, Walk. Cat. Lep. Het. B. M. xii. p. 963.

S. Andamans (Port Blair).

Fam. Hemiceridæ.

Westermannia triangularis, n. sp.

Upperside—fore wing with the basal two thirds shining silvery white, tinged with pale fawn-colour; a subbasal triangular dusky brown patch, the inner angle of which extends to the base and lower angle on hind margin; a broad marginal chalybeous-speckled dark cupreous brown band: hind wing pale cupreous brown externally, pale vinous at the base. Head and basal joint of antennæ white; front of thorax yellowish, hind part of thorax and abdomen brown

with white segmental bands. Underside glossy brown, pale yellowish obliquely across the fore wing and at base of hind wing; abdomen beneath and legs yellowish white; fore legs with black bands.

Expanse $1\frac{2}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Differs from *W. superba* in its smaller size, darker colour, and difference of shape in the subbasal patch.

Fam. Hyblæidæ.

Nolasena dulcissima, Walk. Journ. Linn. Soc. Zool. viii. p. 76.

S. Andamans (Port Blair).

Fam. Gonopteridæ.

Anomis fulvida, Guén. Noct. ii. p. 397; Walk. Catal. Lep. Het. B. M. xiii. p. 988.

S. Andamans (Port Blair).

Fam. Polydesmidæ.

Polydesma boarmoides, Guén. Noct. ii. p. 441; Walk. *l. c.* xiii. p. 1042.

P. mastrucata, Feld. & Roghfr. Nov.-Reise, Lep. iv. pl. iii. f. 31.

S. Andamans (Port Blair).

Fam. Hypogrammidæ.

Ercheia tenebrosa, Moore, P. Z. S. 1867, p. 66.

S. Andamans (Port Blair).

Fam. Catephidæ.

Anophia olivascens, Guén. Noct. iii. p. 48; Walk. Catal. Lep. Het. B. M. p. 1128.

S. Andamans (Port Blair).

Fam. Hypocalidæ.

Hypocala lativitta, n. sp. (Plate LX. fig. 4.)

Upperside—fore wing ochreous brown, basal portion partly covered with short dark brown strigæ, and washed with greyish white on the hind margin and before the apex; a submarginal transverse series of short black pale-bordered dentate streaks, and marginal wavy black line; orbicular and reniform marks grey-speckled: hind wing golden yellow, with a broad black marginal band and an indistinct cell-spot; cilia yellowish white, the middle portion being blackish. Thorax greyish white, collar and tegula, head, and body beneath brownish ochreous. Abdomen yellow, with a greyish dorsal streak and black anal band. Underside yellowish at base, ochreous-white on outer borders; both wings with a broad black discal band, cell-streak, and a marginal row of dots.

Nearest to *H. biarcuata*.

Expanse $1\frac{6}{8}$ inch.

S. Andamans. In coll. F. Moore.

Fam. Catocalidæ.

Blenina lichenosa, n. sp. (Plate LX. fig. 2.)

Upperside—fore wing dark sap-green, with a broad black speckled basal, sinuous-margined discal band, and a sinuous marginal line, the bands being bordered with grey speckles; a black streak near hind part of discal band; two black dots in the cell: hind wing dark golden brown, with a median discal short recurved golden-yellow band: cilia yellow posteriorly, brownish anteriorly. Thorax sap-green, grey- and black-speckled; abdomen dark brown; legs pale brown, black-streaked; antennæ and palpi black. Underside pale golden brown; fore wing crossed by a suffused black discal band, and hind wing by a broad discal and a marginal band.

Expanse 1⅝ inch.

S. Andamans. In coll. F. Moore.

Blenina grisea, n. sp. (Plate LX. fig. 1.)

Upperside—fore wing greyish, sparsely covered with sap-green speckles; crossed by a sinuous black subbasal, three discal, and a submarginal line, the space within the basal sinuous line and the upper portion of the discal lines darker green-speckled; a prominent quadrate black spot above middle of hind margin: hind wing golden yellow, with a broad golden-brown marginal band; cilia pale golden yellow at anal angle, cinereous brown at apex. Thorax grey, speckled with green and black; abdomen golden yellow. Underside pale golden brown; fore wing with an indistinct dusky black median band; hind wing with an indistinct dusky spot on anterior margin, and a broad blackish outer band; legs pale, black-speckled.

Expanse 1⅝ inch.

S. Andamans. In coll. F. Moore.

Fam. Ophiderida.

Ophideres aurantia, n. sp.

Upperside—fore wing deeply excavated on hind margin, dark ochry red, with numerous short transverse grey striæ, veins also grey-streaked; a narrow black oblique band from apex to middle of excavation on hind margin; the oblique band and two outer transverse dusky fasciæ washed inwardly with lilac: hind wing ochry yellow, with a black oval constricted spot above the anal angle and a short curved streak beyond it. Head, palpi, and antennæ dark ochry red; abdomen ochry yellow. Underside ochry yellow; fore wing with a dusky patch at apex and two short curved streaks above posterior angle; hind wing with a black spot above anal angle and an indistinct fascia beyond it.

Expanse 4 inches.

S. Andamans. In coll. British Museum.

Ophideres fullonica, Linn. (Guén. Noct. iii. p. 111).

O. pomona, Cram. Pap. Exot. i. pl. 77. f. C.

O. dioscoræ, Fabr. Spec. Ins. ii. p. 212.

S. Andamans (Port Blair).

Ophideres hypermnestra, Cram. Pap. Exot. iv. pl. 323. f. A, B.

S. Andamans (Port Blair).

Phyllodes consobrina, Westw. Cabinet Orient. Ent. pl. 28. f. 2.

P. perspicillator, Guén. Noct. iii. p. 120.

S. Andamans (Port Blair).

Potamophora manlia, Cram. Pap. Exot. i. pl. 92. f. A.

S. Andamans (Port Blair).

Fam. Erebidæ.

Tavia substruens, Walk. Cat. Lep. Het. B. M. xiv. p. 1276.

S. Andamans (Port Blair).

Argiva hieroglyphica, Drury, Ill. Exot. Ins. ii. pl. 2. f. 1.

S. Andamans (Port Blair).

Nyctipao truncata, n. sp.

Male. Allied to *N. obliterans*, but differs in being smaller, the fore wing having the veins pale-streaked; an indistinct darker subapical recurved streak; the retort mark much smaller, compressed laterally and concave on its outer border, and the recurved streak beneath it not apparent; the hind wing is much smaller, shorter, and less produced at the apex.

Expanse $3\frac{1}{4}$ inches.

S. Andamans. In coll. British Museum.

Nyctipao crepuscularis, Linn. S. N. 2811, 13; Clerck, Icones, pl. 53. f. 1, 4.

S. Andamans (Port Blair).

Fam. Ommatophoridæ.

Speiredonia retrahens, Walk. Cat. Lep. Het. B. M. xiv. p. 1294.

S. Andamans (Port Blair).

Speiredonia conspicua, Feld. Nov.-Reise, Lep. iv. pl. 113. f. 7.

S. Andamans (Port Blair).

Fam. Hypopyridæ.

Spirama cohærens, Walk. Cat. Lep. Het. B. M. xiv. p. 1321, ♀.

S. Andamans (Port Blair).

Hypopyra persimilis, n. sp.

Similar to *H. ossigera*, but differs on the upperside in the fore wing having a distinct brown fascia from the apex to middle of hind margin, and the marginal white lunular band prominent; in the

hind wing the outer pale dentate lunular line is nearer the margin. On the underside the black lunular bands are more curved and wider apart, the outer band being nearer the margin. From *H. feniseca* it may be distinguished by its longer fore wings.

Expanse $3\frac{1}{2}$ inches.

S. Andamans. In coll. British Museum and F. Moore.

HAMODES DISCISTRIGA, Moore, P. Z. S. 1867, p. 78.

S. Andamans (Port Blair).

ENTOMOGRAMMA FAUTRIX, Guén. Noct. iii. p. 204; Feld. Nov.-Reise, Lep. iv. pl. 115. f. 5.

S. Andamans (Port Blair).

Fam. OPHIUSIDÆ.

LAGOPTERA HONESTA, Hübn. Exot. Schmett. f. 1, 2.

S. Andamans (Port Blair).

LAGOPTERA CORONATA, Fabr. Ent. Syst. p. 596. no. 24.

L. leonina, Fabr. ib. no. 25.

L. magica, Hübn. Exot. Schmett. f. 535.

S. Andamans (Port Blair).

ACHÆA MELICERTA, Drury, Ins. i. pl. 23.

A. tigrina, Fabr. Spec. Ins. no. 52.

S. Andamans (Port Blair).

ACHÆA NUBIFERA, n. sp. (Plate LIX. fig. 9, ♂.)

Male and female. Upperside—fore wing vinous brown, crossed by an indistinct subbasal black wavy line and a discal recurved transverse sinuous line with pale lunular outer border; the disk in the male clouded with dark fuliginous brown: hind wing dark cinereous brown, crossed by a narrow white curved median band; a short ochreous streak before anal angle, a pale spot on middle of hind margin, and another at anterior angle. Thorax vinous brown; abdomen cinereous brown, anal tuft ochreous. Underside cinereous brown; disk of fore wing dark fuliginous brown; hind wing with a narrow streak at end of the cell, a transverse broad discal and narrow inner band of dark cinereous brown; palpi cinereous brown; legs cinereous brown above, femora and tibiæ ochreous beneath.

Expanse $2\frac{5}{8}$ inches.

S. Andamans. In coll. F. Moore.

OPHIUSA ARCUATA, n. sp.

Fore wing vinous greyish brown, with a broad dark brown basal band occupying one third of the wing, the band partly crossed near the base by a short pale streak, and its border slightly convex at the middle; a transverse discal band, broadest on the costa, its outer border produced to a point before the apex and then incurved to the

hind margin; two small dentate spots from the point of the band to the apex; veins on outer margin streaked with grey; hind wing dusky brown, with an indistinct pale purplish grey subbasal fascia and a streak from anal angle. Underside dusky brown, with indistinct darker sinuous transverse discal lines.

Expanse $1\frac{7}{8}$ inch.

S. Andamans. In coll. F. Moore.

This species is also common in collections from India, Ceylon, and Java, and is the species described by M. Guénée (Noct. iii. p. 269) as the *O. joviana* of Cramer, remarking that the figure of *O. joviana* (Cram. pl. 399. fig. B) was not correctly given. Unfortunately for M. Guénée, several specimens of *O. joviana* before me, from the Madras and Malabar coasts of India, perfectly agree with Cramer's figure above quoted, and are, moreover, identical with specimens, also before me, from Java, collected by the late Dr. Horsfield, to which he has applied the name of *O. myops*.

HYPÆTRA STIGMATA, n. sp.

Male. Upperside purple-brown: fore wing with a broad, greyish-black, basal, outwardly-oblique band; a similar band beyond, broad on the costa and including a curved brown streak and pale oblique spot, narrowing to hind margin before the angle; the interspace between the bands pale; a marginal row of pale spots and black confluent lunules; cilia brown: hind wing with a black streak from anal angle and marginal lunules beneath: cilia at apex and anal angle white.

Underside brown, crossed by a median transverse row of partly connected black spots; a cinereous silky band or patch in cell of fore wing, and a similar streak below apex of hind wing; antennæ ferruginous-brown; joints of palpi black at sides, white beneath; legs black above, white beneath; tarsi tufted and banded with white.

Expanse $1\frac{4}{8}$ inch.

Andamans. In coll. British Museum.

Fam. POAPHILIDÆ.

ILUZIA PYRALINA, n. sp.

Male. Upperside pale brownish testaceous; both wings with a nearly straight, narrow, brown pale inner-bordered band crossing from before the apex to middle of abdominal margin; a marginal row of black pointed lunules; fore wing with a brown border below the costa, a blackish spot within the cell, an oval spot at its end, and a few indistinct spots beyond; hind wing with an indistinct blackish spot in the cell, and a prominent spot outside the band.

Underside yellowish testaceous; fore wing with a black spot within and a larger spot at end of the cell, a transverse discal straight row of spots and marginal series of pointed lunules; hind wing with a large spot in the cell, two curved, discal, transverse series of spots and marginal row of pointed lunules; legs brownish, streaked with

dark brown; palpi dark chocolate-brown, apical joint pale testaceous; antennæ brown.

Expanse $1\frac{5}{12}$ inch.

S. Andamans. In coll. British Museum.

Fam. Platydidæ.

Episparis varialis, Walk. Cat. Lep. Het. B. M. xvi. p. 7 (1858).

E. signata, Walker, *l. c.* Suppl. p. 1032.

S. Andamans (Port Blair).

Fam. Remigiidæ.

Remigia archesia, Cram. Pap. Exot. iii. pl. 273. f. F, G, ♀.

P. virbia, Cram. *l. c.* f. H.

R. bifasciata, Walker, Cat. Lep. Het. B. M. Suppl. p. 1014.

S. Andamans (Port Blair).

Remigia gregalis, Guén. Noct. iii. p. 320.

S. Andamans (Port Blair).

Fam. Thermesiidæ.

Sympis turbida, n. sp.

Upperside dark brown, suffused with purplish grey at the base, crossed by apparently four equidistant indistinct darker sinuous lines on the fore wing, and one across the middle of hind wing; a small blackish spot at lower end of cell on the fore wing. Underside dull brown, outer sinuous line slightly more prominent; hind wing with a submarginal series of pale points, one on each vein.

Expanse $1\frac{6}{8}$ inch.

S. Andamans. In coll. F. Moore.

Thermesia reticulata, Walker, Cat. Lep. Het. B. M. Suppl. p. 1062.

Drepanodes scitaria, Walker, *l. c.* Geom. p. 1488.

S. Andamans (Port Blair).

Azazia rubricans, Boisduval, Walk. Cat. Lep. B. M. xv. p. 1576.

S. Andamans (Port Blair).

Mestleta duplexa, n. sp. (Plate LX. fig. 5.)

Upperside ochreous; a straight pale purplish-tinted band with ochreous-brown borders extending from apex to above anal angle; fore wing crossed by a subbasal and median sinuous indistinct lines; anterior border of hind wing pale yellow.

Underside much paler, markings nearly obsolete.

Expanse $\frac{6}{8}$ inch.

S. Andamans. In coll. F. Moore.

CAPNODES RUFESCENS, n. sp.

Male. Upperside light red; both wings crossed by rather broad dusky-grey wavy bands, which are more or less confluent; cilia purple, with a marginal whitish inner line; body dusky ferruginous. Underside pale testaceous, speckled with ferruginous; legs pale testaceous.

Expanse $1\frac{2}{10}$ inch.

Andamans. In coll. British Museum.

CAPNODES TRIFASCIATA, n. sp.

Female. Upperside ferruginous; cilia purple; both wings crossed by three dusky-brown wavy bands and an outer lunular line, the basal and third bands traversed by a white, dotted, black, sinuous line; a marginal row of black pointed lunules.

Underside dusky-brown, palest on hind wing; both wings crossed by two curved, discal, indistinct, dusky bands; palpi and legs greyish, speckled with brown.

Expanse $1\frac{3}{10}$ inch.

Andamans. In coll. British Museum.

FASCELLINA CASTANEA, n. sp.

Differs from *F. chromataria* from Sikkim, on the fore wing, in the white spot at end of the cell being small, narrow, and pointing obliquely inward instead of outward, has also a smaller apical patch. On the underside the base of the wings is yellow, the transverse discal chestnut-brown band on the fore wing is sinuous on its outer border, and broad and produced before the apex. Other markings similar.

Expanse $1\frac{4}{5}$ inch.

S. Andamans. In coll. British Museum.

PLEURONA FALCATA. (Plate LX. fig. 6.)

Pleurona falcata, Walker, Cat. Lep. Het. B. M. Suppl. p. 1564.

S. Andamans (Port Blair).

Fam. HYPENIDÆ.

HYPENA QUINQUELINEALIS, n. sp.

Upperside—fore wing purplish-cinereous; some short brown streaks on costa before the apex; three white lines with brown inner borders obliquely from apex to hind margin, an inner median wavy brown line; a brown line also on extreme outer margin, with a white cilial border: hind wing pale testaceous white, with brown marginal line. Thorax cinereous white; abdomen testaceous white.

Underside pale testaceous; both wings reddish testaceous at the apex, and crossed by an indistinct, curved, discal, linear row of short brown streaks; legs and antennæ pale testaceous.

Expanse $\frac{5}{8}$ inch.

S. Andamans. In coll. F. Moore.

H. DENTILINEALIS, n. sp.. (Plate LX. fig. 7.)

Upperside—fore wing testaceous-white, sparsely speckled with black scales; an oblique pale brown dentated line from apex to middle of hind margin; a short, black, linear spot at upper end of the cell; an oblique submarginal series of small, indistinct, black spots: hind wing and abdomen cinereous-brown: thorax testaceous-white.

Underside—fore wing testaceous-yellow, clouded with cinereous-brown; hind wing cinereous-white; antennæ and legs cinereous-brown.

Expanse 1 inch.

S. Andamans. In coll. F. Moore.

Fam. HERMINIDÆ.

BERTULA ALBINOTALIS, n. sp.

Upperside dark purplish fawn-colour; a black, broad, subbasal, oblique band crossing both wings; a marginal wavy, yellow spotted black line; fore wing with a short, black, oblique, apical streak, which is indistinctly continued across the hind wing; a yellow oval spot at end of the cell.

Underside purplish-brown, a yellowish oval spot at end of cell in both wings. Body and legs brown.

Expanse $1\frac{1}{12}$ inch.

Andamans. In coll. British Museum.

Allied to *B. mysalis* and *B. hypenalis*, Walk., from Ceylon.

APPHADANA EVULSALIS, Walk. Cat. Lep. Het. B. M. Suppl. 1212.

S. Andamans (Port Blair).

HYDRILLODES SUBBASALIS, n. sp. (Plate LX. fig. 8.)

Upperside—fore wing blackish-brown, with a broad, subbasal, pale yellowish-testaceous band, which is slightly brown speckled, and has a blackish dot in the cell; hind wing pale testaceous, with an indistinct dusky brown marginal band.

Underside—fore wing brown; hind wing whitish-testaceous, with a submarginal row of pale lunules, and a black streak in the cell; palpi and legs blackish, streaked with pale testaceous.

Expanse 1 inch.

S. Andamans. In coll. British Museum and F. Moore.

HYDRILLODES TRANSVERSALIS, n. sp.

Upperside pale brown; fore wing with a white zigzag median transverse line; cilia of hind wing alternate brown and grey. Underside paler; both wings with a median discal transverse darker band, which is sinuous on the hind wing; palpi and legs above black speckled.

Expanse $1\frac{1}{8}$ inch.

S. Andamans. In coll. F. Moore.

CYCLOPTERYX CANALIFERALIS, n. sp.

Upperside—fore wing pale sienna-brown, outer margin and cilia

fuliginous, with a median transverse narrow white wavy band, dentated and enclosing a small spot at end of the cell; some white speckles on costa at apex and also on the cilia: hind wing pale brown; cilia white: thorax sienna-brown, white-speckled; abdomen brown; palpi brown, basal points tipt with white. Legs white. Underside pale dusky brown, whitish at base of hind wing.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. British Museum.

RIVULA BIOCULALIS, n. sp.

Pale ochry-yellow; fore wing with five short white transverse streaks on the costa, a row of white and black dots on outer margin, two pale-bordered black dots at end of the cell one above the other, and a transverse discal curved wavy brown line. Underside paler; fore wing brownish in the middle.

Expanse $\frac{4}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

RIVULA OCULALIS, n. sp.

Upperside—fore wing pale testaceous, fawn-colour along the costa and exterior margin; a black spot with white centre at end of the cell; a black dot on middle of costa, and a row of pale-bordered black dots on outer margin; cilia black: hind wing pale yellowish-white, with narrow blackish marginal line; cilia white. Body and legs pale brown. Underside paler than above, markings the same.

Expanse $\frac{4}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Tribe PYRALES.

Fam. PYRALIDÆ.

PYRALIS TRIFASCIALIS, n. sp. (Plate LX. fig. 9.)

Male. Upperside ferruginous; fore wing with a white costal median band, a short oblique band at apex, and a paler white band below it to hind margin; hind wing with a transverse discal white band, the inner margin of which is bordered with dark ferruginous. Underside—fore wing with white bands as above; three oblique subbasal ferruginous-brown-maculated bands with purple interspaces: hind wing crossed by ferruginous-brown bands, the interspaces white and traversed with short-brown strigæ: legs whitish, streaked with ferruginous.

Expanse $1\frac{1}{12}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

PYRALIS OCHREALIS, n. sp.

Ochry-yellow; fore wing with four darker slightly wavy transverse bands, and three on the hind wing terminating at anal angle; a darker marginal line. Body, antennæ and palpi yellow. Legs ochry-brown; fore tarsi and bands on tuft, streak beneath mid and hind tibiæ, and their tarsi white.

Expanse, ♂ $\frac{3}{4}$, ♀ 1 inch.
S. Andamans (Port Blair).
Has also been taken in Sikkim. In coll. F. Moore.

Fam. Asopidæ.

Samea cuprinalis, n. sp.

Male pale purplish-yellow, diaphanous; cilia whitish, alternated with brown; fore wing with two cupreous-brown spots in the cell, beneath which are two narrow wavy lines, a broad outer marginal band bordered by a narrow wavy inner line; hind wing with a pale-centred brown spot at end of cell and a narrow line beneath, a broad marginal band and inner wavy bordered line. Body purplish-yellow, brown-speckled; anal tuft white, antennæ pale brown. Legs pale-yellowish, fore legs and middle femora and tibiæ with a black spot at the joints.
Expanse $\frac{6}{8}$ inch.
S. Andamans (Port Blair). In coll. British Museum.

Samea purpurascens, n. sp.

Male. Upper and underside very pale purplish grey; fore wing with two blackish-bordered pearly white spots within the cell, and a short transverse series of smaller contiguous spots before the apex; two indistinct median transverse dusky-brown bands, which also cross the hind wings; outer edges of wings brown. Legs whitish, banded with brown.
Expanse $\frac{8}{10}$ inch.
S. Andamans (Port Blair). In coll. British Museum.

Asopia limbolalis, n. sp.

Upperside silky gamboge-yellow; fore wing with four and hind wing with two short oblique transverse ochry-red bands; both wings with a broad golden-brown pale-bordered marginal band. Cilia of fore wing yellow, of hind wing brown, bordered by a blackish marginal line. Body ochry-brown above, beneath and legs yellowish-white. Palpi ochry-yellow. Underside pale silky-yellow with broad golden-brown band.
Expanse $\frac{7}{10}$ inch.
S. Andamans (Port Blair). In coll. British Museum.

Leucinodes orbonalis, Guén. Delt. et Pyr. p. 223 (1854).
S. Andamans (Port Blair).

Coptobasis andamanalis, n. sp. (Plate LX. fig. 14.)

Allied to *Cop. æmealis*, Walk.

Glossy cupreous-brown; fore wing with a pale yellowish spot at end of the cell, an oval spot beyond, and a smaller one beneath them; hind wing with two yellow median transverse spots. Cilia cinereous. Body above brown, beneath whitish. Palpi black tipt. Base of tibiæ and first joint of tarsi banded with black.
Expanse $\frac{7}{8}$ inch.
S. Andamans (Port Blair). In coll. British Museum.

COPTOBASIS LUNALIS, Guén. Delt. et Pyr. p. 352.

Botys Thyasalis, Walk. Catal. Lep. B. M. xviii. p. 734.

S. Andamans (Port Blair).

COPTOBASIS CUPREALIS, n. sp. (Plate LX. fig. 13.)

Upperside bright coppery-brown; fore wing with three equidistant transverse black narrow bands; hind wing with two transverse bands, the outer one short, a marginal and cilial black line. Underside paler, cinereous brown at base; transverse lines indistinct. Base of palpi white. Legs cinereous, fore and mid tibiæ with black bands.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. F. Moore.

PHYSEMATIA CONCORDALIS, Lederer, Wien. ent. Monat. vii. p. 447, pl. 17. f. 14 (1863).

Nicobars.

DICHOCROSIS FRENATALIS, Lederer, Wien. ent. Monat. viii. p. 447, pl. 17. f. 15 (1863).

Nicobars.

Fam. HYDROCAMPIDÆ.

OLIGOSTIGMA SEXPUNCTALIS, n. sp. (Plate LX. fig. 12.)

Male. Fore wing ochry-yellow, with a black line on base of costa, a triangular spot bordered with silver beyond, two oblique subapical short bands from the apex, both lined within with silver, and a prominent silver streak with indistinct blackish lower border beneath the cell: hind wing transparent white at base, yellow at apex, a marginal quadrate black spot adorned with varied metallic scales, the cilia adjoining marked with six black spots with white interspaces; a short indistinct black-speckled streak bordered with silver above the black spot. Body pale ochreous, whitish beneath. Antennæ brown. Legs ochreous, streaked with brown.

Expanse $\frac{7}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

OLIGOSTIGMA PARVALIS, n. sp.

White: fore wing with a golden-yellow band on the costa, exterior, and hind borders, and short subapical bands; the band on exterior border with black margins: hind wing with two golden-yellow bands, each black-margined; a black spot on outer band below the apex.

Expanse $\frac{4}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

Fam. SICULIDÆ.

RHODONEURA RETICULALIS, n. sp.

Silvery white, veins of fore wing blackish. Upperside with blackish hexagonal-shaped reticulations; many of the spaces on fore wing

centred by a short streak. Underside as above; space within the cell and apex of fore wing slightly cupreous. Abdomen narrowly banded with black. Palpi and legs grey, tarsi banded with black. Antennæ brown.

Expanse $1\frac{1}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Rhodoneura tetraonalis, n. sp. (Plate LX. fig. 10.)

Male and female, silvery white. Upperside of both wings with numerous delicate greyish-black strigæ, crowded and slightly reticulated on the fore wing, and transversely and lineally disposed on the hind wing; fore wing with a darker streak on a space free from strigæ near posterior angle, and a black dot at the apex. Abdomen with slight dorsal black bands. Underside as above, metallic, silvered below the costa, strigæ darker, and streak on fore wing near posterior angle prominent; apical black spot large and centred with a white dot. Legs banded with black.

Expanse $\frac{7}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

Allied to *R. puralis* and *R. bastialis*, Walk.

Rhodoneura marmorealis, n. sp.

Male. Silvery white. Upperside reticulated with delicate greyish-black strigæ; costa of fore wing blackish, the edge dotted with white. Abdomen blackish-cinereous at tip, tuft brown. Underside reticulated as above; costa cupreous-brown. Legs greyish white; tibiæ streaked and tarsi banded with white.

Expanse $\frac{6}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

Fam. Spilomelidæ.

Phalangiodes neptisalis, Cram. Pap. Exot. iii. pl. 264. f. F; Guén. Delt. et Pyr. p. 279.

S. Andamans (Port Blair).

Pycnarmon obinusalis (*Astura ob.*), Walk. Catal. Lep. B. M. xviii. p. 549.

Nicobars (Kamorta), April, *Meldola*.

Pycnarmon discinotalis, n. sp.

Allied to *P.* (*Zebronia*) *plutusalis*, Walk.

White: fore wing with four and hind wing with three dark-yellow transverse bands; the inner discal band on both wings bent towards the posterior angle; also a similar-coloured band on the outer margin, and dark band on cilia; a black spot within the cell.

Expanse $\frac{7}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

May be distinguished from *P. plutusalis* by both wings having an

additional yellow band immediately on the outer margin, and only one dark band on cilia.

CONCHYLODES ÆRIFERALIS, n. sp.

Allied to *C.* (*Zebronia*) *lactiferalis*, Walk.

Wings pale brassy-yellow, costa whitish; fore wing with two black spots in the cell, first minute, a streak below each, a streak from costa before the apex terminating on a spot near posterior angle; two small spots on costa, one near base, the other before outer streak: hind wing with a black spot within the cell, another near middle of outer margin, and wavy transverse streak terminating in a spot on margin above anal angle. Body and legs white; antennæ yellowish.

Expanse $\frac{8}{10}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Fam. MARGARONIDÆ.

GLYPHODES ACTORIONALIS, Walker, Catal. Lep. Het. B. M. xvii. p. 498 (1859).

S. Andamans (Port Blair.)

GLYPHODES MARGINALIS, n. sp. (Plate LX. fig. 15.)

Male. Silvery white; both wings with a broad marginal brown band, bordered inwardly by a wavy black line; fore wing with a brown streak along base of costa, a transverse narrow outward-curved subbasal band and a large spot at end of the cell; hind wing with an outward-curved brown streak below the cell. Body above silvery white; a dorsal streak from head to anal tuft, and sides of thorax brown; tuft yellow. Palpi brown. Legs whitish. Underside much paler-marked.

Expanse 1 inch.

S. Andamans. In coll. F. Moore.

SYNCLERA CÆSALIS (*Glyph. cæs.*), Walk. (*l. c.*) p. 449.

S. Andamans (Port Blair).

CYDALIMA LATICOSTALIS (*Margarodes lat.*), Guén. Delt. et Pyr. p. 303, ♀ (1854).

Marg. leodicealis, Walker, Catal. Lep. B. M. pt. xviii. p. 529.

S. Andamans (Port Blair).

PACHYARCHES MALIFERALIS, Walk. Catal. Lep. Het. B. M. Suppl. p. 1363 (1865).

S. Andamans (Port Blair).

PACHYARCHES TIBIALIS, n. sp.

Male. Pale green above, tinged with pale brown beneath; cilia cinereous; a woolly tuft near anal angle beneath; palpi green, white beneath; abdomen blackish at the tip; legs pale green; fore tibiæ

at the apex and a tuft on first joint of tarsi ochreous; hind tibiæ clothed with brown hairs above.

Expanse $1\frac{1}{8}$ inch.

S. Andamans. In coll. British Museum.

Calcutta District. In coll. F. Moore.

Allied to *P. maliferalis*, but differs in the absence of the black spot at end of the cell in both wings, and in the different-coloured palpi.

Auxomitia mirificalis, Lederer, Wien. ent. Monat. vii. p. 391, pl. 13. f. 1 (1863).

Nicobars; S. Andamans (Port Blair).

Fam. Botydæ.

Botys illisalis, Walker, Catal. Lep. Het. B. M. xviii. p. 653; Lederer, Wien. ent. Mon. vii. pl. 9. f. 12.

S. Andamans (Port Blair).

Botys multilinealis, Guén. Delt. et Pyr. p. 327, pl. 8. f. 11; Lederer, Wien. ent. Mon. vii. pl. 11. f. 3.

Zebronia salomealis, Walk. Catal. Lep. B. M. xviii. p. 476.

B. annuligeralis, Walk. (*l. c.*) Suppl. p. 1424.

S. Andamans (Port Blair).

Botys scinisalis. (Plate LX. fig. 11.)

Botys scinisalis, Walker, Catal. Lep. B. M. xviii. p. 648 (1859).

B. disjunctalis, Walk. Des. of Und. Lep. Het. p. 96 (1869).

S. Andamans (Port Blair).

Botys ardealis, Felder, Novara-Reise, Lep. iv. pl. 131. f. 31.

Nicobars.

Botys stultalis, Walker, Catal. Lep. Het. B. M. xviii. p. 669

S. Andamans (Port Blair).

Botys thoasalis. (Plate LX. fig. 16.)

Botys thoasalis, Walk. (*l. c.*) p. 692.

S. Andamans (Port Blair).

Botys vinacealis, n. sp.

Allied to *B. caletorialis*, Walk.

Male. Pale glossy purplish-brown; fore wing with an indistinct blackish streak crossing end of the cell, a transverse zigzag line before the apex, another below the cell, and a similar recurved zigzag line on hind wing; both wings with a marginal row of narrow blackish lunules. Body and antennæ pale brown, tip of abdomen above white. Fore legs with white bands, mid legs streaked laterally with white; palpi dark brown, basal joint white.

Expanse $1\frac{2}{10}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Botys abstrusalis, Walk. Catal. Lep. B. M. xvii. p. 663.

B. retractalis, Walk. (*l. c.*) Suppl. p. 1447.

S. Andamans (Port Blair).

Botys opalinalis, n. sp.

Upperside pale silky brownish yellow with greyish opaline reflections; fore wing with two very indistinct brownish spots in the cell and a recurved transverse discal line. Body and legs ochreous-white; palpi and antennæ brown. Underside ochreous-white.

Allied to *B. megapteralis*, Walk.

Expanse $1\frac{5}{8}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

Botys immundalis, Walk. Catal. Lep. Het. B. M. Suppl. p. 1448.

S. Andamans (Port Blair).

Tribe Crambices.

Fam. Galleridæ.

Propachys linealis, Moore, P. Z. S. 1867, p. 665, pl. 33. fig. 17.

S. Andamans (Port Blair).

Tribe Uranides.

Fam. Nyctalemonidæ.

Nyctalemon najabula, n. sp.

Smaller and of a much darker fuliginous-brown colour, both above and below, than the Indian *N. zampa* and the Malayan *N. docile*, and has a narrower median transverse pale band on both wings above than the former species; and on the underside these bands are well defined and narrow.

Expanse 5 inches.

S. Andamans (Port Blair). In coll. F. Moore.

Tribe Geometres.

Fam. Urapteridæ.

Urapteryx crocopterata, Kollar, Hügel's Kasch. iv. p. 483 (1844).

S. Andamans (Port Blair).

Fam. Ennomidæ.

Hyperythra lutea, Cram. Pap. Exot. iv. pl. 370. f. C, D, ♀.

H. limbolaria, Guén. Phal. i. p. 101, pl. 3. f. 3, 4, ♀.

H. susceptaria, Walk. Catal. Lep. B. M. Suppl. p. 1664, ♀.

H. penicillaria, Guén. (*l. c.*) p. 101, ♂.

S. Andamans (Port Blair).

OMIZA AFFINIS, n. sp.

Differs from *O. pachiaria*, Walk, from Sikkim, above in being more uniformly coloured, the transverse band more prominent, and beneath in the darker and uniform chrome-colour of both wings, a smaller spot at end of the cells, and in the hind wing having a distinct recurved median band formed of dark chrome-coloured speckles.

Expanse $1\frac{1}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Fam. BOARMIDÆ.

AMBLYCHIA TORRIDA, n. sp.

Similar to *A. angeronaria* from Sikkim, but differs in the fore wing both above and beneath in having the transverse median pale maculated band terminating very broadly on the costa in the male, and in broad quadrate spots in the female. On the underside the distinct subbasal curved dusky band which crosses both wings of *A. angeronaria* are obsolete, and the outer transverse lunular bands are replaced by a uniform broad pale brownish fascia.

Expanse, ♂ $3\frac{1}{4}$, ♀ $3\frac{3}{4}$ inches.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

HYPOCHROMA PERFECTARIA, Walk. Catal. Lep. B. M. p. 434.

H. nyctemerata, Walk. *l. c.* Suppl. p. 1543.

S. Andamans (Port Blair).

BITHIA EXCLUSA (*Hemerophila ex.*), Walk. Catal. Lep. B. M. xxii. p. 320 (1861).

Acidalia imprimata, Walk. *l. c.* p. 771.
Macaria obstataria, Walk. *l. c.* p. 928.
B. lignaria, Walk. *l. c.* Suppl. p. 1600.

S. Andamans (Port Blair).

Fam. GEOMETRIDÆ.

THALASSODES CÆLATARIA, Walk. Catal. Lep. B. M. xxii. p. 552.

S. Andamans (Port Blair).

Fam. PALYADÆ.

EUMELIA LUDOVICATA, Guén. Phal. i. p. 393.

S. Andamans (Port Blair).

Fam. ACIDALIDÆ.

TRYGODES DIVISARIA (*Macaria div.*) Walk. Catal. Lep. B. M. xxiii. p. 927.

S. Andamans (Port Blair).

ACIDALIA ATTENTATA, Walk. Catal. Lep. B. M. xxiii. p. 754.

S. Andamans (Port Blair).

ACIDALIA REMOTATA, Guén. Phal. i. p. 458.

S. Andamans (Port Blair).

ZANCLOPTERYX SAPONARIA, H. Schäff. (Walk. Catal. Lep. B. M. xxiii. p. 810).

S. Andamans (Port Blair).

Fam. MICRONIDÆ.

MICRONIA VAGATA, n. sp. (Plate LX. fig. 18.)

Male. Form and pattern of *M. caseata*, Guén., from Java, Smaller in size, and pure white above, the oblique bands formed of short narrow grey strigæ and less prominent; the margins of the bands not linearly defined as in that species, being composed of more straggling strigæ, thus giving less open interspaces between the bands. Underside pale grey.

Expanse $1\frac{3}{10}$ inch.

S. Andamans (Port Blair). In coll. F. Moore.

MICRONIA ACULEATA, Guén. Phal. ii. p. 26, pl. 13. f. 8.

S. Andamans (Port Blair).

MICRONIA OBTUSATA, Guén. Phal. ii. p. 25, pl. 5. f. 6.

S. Andamans (Port Blair).

MICRONIA OBLIQUARIA, n. sp. (Plate LX. fig. 17.)

White. Upperside with numerous short transverse dusky brown strigæ uniformly disposed: fore wing with two oblique dusky brown bands, formed by confluent strigæ proceeding from the apex and crossing the hind wing to abdominal margin; the hind wing also with an outer but less distinctly formed transverse band; a narrow black wavy marginal line on both wings, and small lanceolate spot at middle angle of hind wing. Underside white, with the bands indistinctly visible. Palpi and tarsi fuliginous.

Expanse $1\frac{4}{5}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

This species is also found at Darjiling.

ZOMIA PALLIDA, n. sp.

Fore wing pale greyish-white, sparsely streaked with brown, an indistinct transverse subbasal curved pale brown band and curved streak before posterior angle; hind wingpale ochreous at base. Body and legs pale brown; antennæ and palpi dark brown. Underside pale whitish testaceous.

Expanse $1\frac{1}{8}$ inch.

S. Andamans (Port Blair). In coll. British Museum.

Fam. Macaridæ.

Macaria nora, Walk. Catal. Lep. B. M. xxiii. p. 934.
S. Andamans (Port Blair).

Tribe Tortrices.

Grapholitha novarana, Felder, Novara-Reise, Lep. iv. pl. 137. f. 49.
Nicobars.

Choreutes novaræ, Felder, Novara-Reise, Lep. iv. pl. 138. f. 14.
Nicobars.

Tribe Tineines.

Fam. Gelechidæ.

Binsitta niviferana, Walk. Catal. Lep. B. M. pt. xxix. p. 832.
S. Andamans (Port Blair).

Blabophanes insularis, Felder, Novara-Reise, Lep. iv. pl. 140. f. 21.
S. Andamans (Port Blair).

Syme orbicularis, Felder, Novara-Reise, Lep. iv. pl. 140. f. 27.
S. Andamans (Port Blair).

Tabular List, showing Geographical Distribution.

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N.E. India.	S. India.	Ceylon.
Papiliones.									
Fam. *Danaidæ.*									
Danais limniace	...	*	...	...	...	*	*	*	*
—— agleoides	...	*	...	*					
—— grammica	...	*	*	*	*	*			
—— melanoleuca, n. sp.	*								
—— nesippus	...	*							
—— plexippus	...	*	...	*	*	...	*	*	
Euplœa novaræ	...	*							
—— esperi	...	*							
—— andamanensis	*								
—— camorta, n. sp.	...	*							
Hestia agamarschana	*								
Fam. *Satyridæ.*									
Lethe europa	*	...	...	*	*	...	*	*	
Melanitis leda	*	...	...	*	...	...	*	*	*

Tabular List (continued).

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N.E. India.	S. India.	Ceylon.
Mycalesis medus	...	*	*	*	*	...			
—— drusia	*	*	...	...	...	...	*		
—— samba	*	...	...	...	...	...	*		
—— radza, n. sp.	*								
Elymnias cottonis	*								
Fam. *Morphidæ*.									
Amathusia phidippus	*	...	...	*					
Discophora celinde	*	...	...	...	...	...	*		
Fam. *Nymphalidæ*.									
Cethosia nicobarica	...	*							
Cirrochroa anjira, n. sp.	*								
Cynthia erota	*	...	...	...	...	...	*		
Messaras nicobarica	...	*							
Atella alcippe	*	...	...	...	...	...	*		
Pyrameis cardui	*	...	...	*	...	...	*	*	*
Junonia œnone	*	...	...	*	...	*	...	*	
—— nicobariensis	...	*							
Doleschallia pratipa	*	...	...	...	*	...	*		
Kallima albofasciata, n. sp.	*								
Eurytela horsfieldi	*	...	...	*					
Cyrestis formosa	*								
Diadema bolina	*	...	...	...	...	...	*	*	*
—— jacintha	*	*	...	...	...	...	*	*	*
Herona andamana, n. sp.	*								
Parthenos gambrisius	*	...	...	...	...	...	*		
Limenitis anarta, n. sp.	*								
Neptis andamana, n. sp.	*								
—— mananda, n. sp.	*								
—— nicobarica, n. sp.	...	*							
—— cnacalis	*								
Tanaëcia cibaritis	*								
—— acontius	*								
Symphædra teutoides, n. sp.	*								
Fam. *Lemoniidæ*.									
Abisara kausambi	*	...	*	*	*				
—— bifasciata, n. sp.	*								
Fam. *Lycænidæ*.									
Curetis saronis, n. sp.	*								
Pithecops hylax	*	...	*	*					
Castalias ethion	*	...	...	...	...	*	...	...	*
—— elna	*	...	*	*					
—— manluena	...	*							
Lampides ælianus	*	...	...	*	*	...	*	*	*
—— cnejus	...	*	...	*	...	...	*	*	
—— pandava	...	*	*	*	...	...	*	...	*
—— strabo	*	...	...	*	...	...	*	*	*
—— kinkurka	...	*							
—— kankena	...	*							

Tabular List (continued.)

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N.E. India.	S. India.	Ceylon.
Lampides kondulana	*	*							
Lycænesthes macrophthalma	...	*							
Lycæna sangra	*	*	...	...	...	...	*	...	*
Aphnæus zoilus, n. sp.	*								
Hypolycæna andamana, n. sp.	*								
—— eltola	*								
Sithon areca	...	*							
—— kamorta	...	*							
Deudorix orseis	...	*	*						
—— epijarbas	*	...	...	...	...	...	*	...	*
Myrina prabha, n. sp.	*								
Amblypodia zeta, n. sp.	*								
—— nakula	*	...	...	...	*				
Fam. *Pieridæ*.									
Terias formosa	*	...	...	*					
—— nicobariensis	*	*							
Hebomoia glaucippe	*	...	...	*	...	*	*	...	*
Ixias andamana, n. sp.	*								
Appias galathea	...	*							
Catopsilia catilla	*	...	...	*	*	...	*	*	*
—— crocale	*	*	...	*	...	...	*	*	*
—— chryseis	*	...	...	...	*	...	...	...	*
Pieris nama	*	...	...	...	...	...	*		
—— lichenosa, n. sp.	*								
Eronia naraka, n. sp.	*								
Fam. *Papilionidæ*.									
Ornithoptera heliconoides, n. sp.	*								
Papilio mayo	*								
—— charicles	*								
—— rhodifer	*								
—— camorta, n. sp.	...	*							
—— nicobarus	...	*							
—— agamemnon	*	*	...	*	*	...	*	*	*
——? eurypilus (? Axion)	*	...	*	...	*				
—— antiphates	*	...	*	*	...	...	*		
Fam. *Hesperidæ*.									
Ismene chromus	*	...	*	*	...	...	...	*	*
—— malayana	*	...	...	...	*				
Tagiades alica, n. sp.	*								
—— helferi	...	*							
Plesioneura alysos	*	...	*	*	...	...	*	*	*
Hesperia cahira, n. sp.	*								
—— oceia	*								
—— colaca, n. sp.	*								
—— mathias	...	*	...	*	...	...	*	*	*
—— beturia	*	...	...	...	...	...	*		
Telegonus thyrsis	*	...	...	*	...	*	*	*	*
Pamphila purrœa, n. sp.	*								
—— gola, n. sp.	*								
—— mesoïdes	*	...	...	*	*	...	...	...	*

Tabular List (continued.)

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N.E. India.	S. India.	Ceylon.
SPHINGES.									
Pergesa acteus	*	...	...	*	*	...	*	*	*
Panacra busiris	*	...	...	...	...	...	*		
Chærocampa nessus	*	...	...	*	...	...	*	*	*
—— tenebrosa, n. sp.	*								
Acherontia morta	*	...	...	*	...	...	*	*	*
Triptogon andamana, n. sp.	*								
Clanis phalaris	*	*	...	...	...	...	...	*	
Calymnia pavonica, n. sp.	*								
Protoparce orientalis	*	...	...	*	*	...	*	*	*
BOMBYCES.									
Fam. *Agaristidæ*.									
Eusemia albomarginata	*	...	...	...	...	*			
Fam. *Zygænidæ*.									
Eressa affinis, n. sp.	*								
Euchromia polymena	*	...	...	...	...	*	*	*	*
Fam. *Arctiidæ*.									
Alphenus biseriatus, n. sp.	*								
Fam. *Lithosiidæ*.									
Lithosia intermixta	*	...	...	...	...	...	...	*	
—— antica	*	...	...	...	...	...	...	...	*
Sesapa andamana, n. sp.	*								
Barsine trivitatta, n. sp.	*								
Argina cribraria	*	*	...	*	*	...	*	...	*
Fam. *Hypsidæ*.									
Peridrome orbicularis	*	...	...	...	...	*	*		
Euplocia membliaria	*	...	...	...	...	*			
Damalis alciphron	*	...	...	*	...	...	*	*	
Hypsa andamana, n. sp.	*								
—— venalba, n. sp.	*								
Philona cinerascens, n. sp.	*	...	...	*					
Fam. *Callidulidæ*.									
Cleosiris catamita	*	...	...	...	...	...	*		
Fam. *Nyctemeridæ*.									
Nyctemera lacticinia	*	...	...	*	...	...	...	*	*
Pitasila leucospilota, n. sp.	*								
Fam. *Euschemidæ*.									
Euschema andamana, n. sp.	*								
—— rœpstorffi, n. sp.	*								
Celerena andamana	*								
Fam. *Chalcosiidæ*.									
Cyclosia nigrescens, n. sp.	*								

Tabular List (continued.)

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N. E. India.	S. India.	Ceylon.
Fam. *Liparidæ*.									
Redoa flavescens, n. sp.	*								
—— sericea, n. sp.	*								
Caviria cygna, n. sp.	*								
Læla venosa, n. sp.	*								
Euproctis discinota, n. sp.	*								
Fam. *Psychidæ*.									
Mahasena andamana, n. sp.	*								
Fam. *Saturniidæ*.									
Actias selene	*	...	...	...	...	...	*	*	*
—— ignescens, n. sp.	*								
Antheræa andamana, n. sp.	*								
Noctues.									
Fam. *Leucanidæ*.									
Leucania costalis, n. sp.	*								
Fam. *Glottulidæ*.									
Ramadasa pavo	*	...	...	...	...	...	...	...	*
Fam. *Apamidæ*.									
Spodoptera cilium	*	...	...	*	...	...	*		
—— nubes	*	...	...	*	...	...	*		
Prodenia ciligera	*	...	...	*	...	...	*	*	
Illatia cephusalis	*	...	...	...	...	...	...	*	
Perigea canorufa	*	...	...	...	...	...	*	*	
Thalpophila cuprea, n. sp.	*								
Fam. *Caradrinidæ*.									
Amyna selenampha	*	...	...	*	...	...	...	*	*
Fam. *Hamerosidæ*.									
Apsarasa figurata, n. sp.	*								
Fam. *Acontidæ*.									
Xanthodes transversa	*	...	...	*	...	...	*	*	
Acontia signifera	*	...	...	...	...	...	*		
Fam. *Palindidæ*.									
Homodes crocea	*	...	...	*	...	...	...	...	*
Fam. *Eriopidæ*.									
Callopistria exotica	*	...	...	*	...	...	*	...	*
Fam. *Eurhipidæ*.									
Ingura cristatrix	*	...	...	*					
Fam. *Plusiidæ*.									
Plusiodonta conducens	*	...	...	...	...	...	...	...	*

Tabular List (continued.)

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N.E. India.	S. India.	Ceylon.
Fam. *Hemiceridæ*.									
Westermannia triangularis, n. sp.	*								
Fam. *Hyblæidæ*.									
Nolasena dulcissima	*	...	...	...	...	...	...	...	*
Fam. *Gonopteridæ*.									
Anomis fulvida	*	...	...	*	...	...	*	...	*
Fam. *Polydesmidæ*.									
Polydesma boarmoides	*	...	...	*	...	...	*	...	*
Fam. *Hypogrammidæ*.									
Ercheia tenebrosa	*	..	...	...	...	...	*		
Fam. *Catephidæ*.									
Anophia olivascens	*	...	...	*	...	...	*	...	*
Fam. *Hypocalidæ*.									
Hypocala lativitta, n. sp.	*								
Fam. *Catocalidæ*.									
Blenina lichenosa, n. sp.	*								
—— grisea, n. sp.	*								
Fam. *Ophideridæ*.									
Ophideres aurantia, n. sp.	*								
—— fullonica	*	...	...	*	*	...	*	...	*
—— hypermnestra	*	...	...	*	...	...	*	...	*
Phyllodes consobrina	*	...	...	...	...	...	*		
Potamophora manlia	*	...	...	*	...	...	*	...	*
Fam. *Erebidæ*.									
Tavia substruens	*	...	...	...	...	...	*		
Fam. *Ommatophoridæ*.									
Speiredonia retrahens	*	...	...	*	...	...	...	*	*
—— conspicua	*								
Argiva hieroglyphica	*	...	...	*	...	...	*	*	*
Nyctipao crepuscularis	*	...	...	*	...	...	*	*	*
—— truncata, n. sp.	*								
Fam. *Hypopyridæ*.									
Spirama cohærens	*	...	...	...	...	...	*	...	*
Hypopyra persimilis, n. sp.	*								
Hamodes discistriga	*	...	...	...	...	...	*		
Entomogramma fautrix	*	...	...	*	...	...	*	...	*
Fam. *Ophiusidæ*.									
Lagoptera honesta	*	...	...	...	...	...	*	*	*
—— coronata	*	...	...	...	*	...	*	*	*

Tabular List (continued).

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N. E. India.	S. India.	Ceylon.
Achæa melicerta	*	...	...	*	...	...	*	*	*
—— nubifera, n. sp.	*								
Ophiusa arcuata, n. sp.	*								
Hypætra stigmata, n. sp.	*								
Fam. *Platydidæ.*									
Episparis varialis	*	...	...	...	...	...	*	...	*
Fam. *Poaphilidæ.*									
Iluza pyralina, n. sp.	*								
Fam. *Remigiidæ.*									
Remigia archesia	*	...	...	*	...	*	*	...	*
—— gregalis	*	...	...	*					
Fam. *Thermesiidæ.*									
Sympis turbida, n. sp.	*								
Thermesia reticulata	*	...	...	...	...	...	*	*	*
Azazia rubricans	*	...	...	*	...	...	*	*	*
Mestleta duplexa, n. sp.	*								
Capnodes rufescens, n. sp.	*								
—— trifasciata, n. sp.	*								
Fascellina castanea, n. sp.	*								
Fam. *Hypenidæ.*									
Hypena quinquelinealis, n. sp.	*								
—— dentilinealis, n. sp.	*								
Bertula albinotalis, n. sp.	*								
Hydrillodes subbasalis, n. sp.	*								
—— transversalis, n. sp.	*								
Apphadana evulsalis	*								
Cyclopteryx canaliferalis, n. sp.	*								
Rivula bioculalis, n. sp.	*								
—— oculalis, n. sp.	*								
PYRALES.									
Fam. *Pyralidæ.*									
Pyralis trifascialis, n. sp.	*								
—— ochrealis, n. sp.	*	..	...	...	...	...	...	*	
Fam. *Asopidæ.*									
Samea cuprinalis, n. sp.	*								
—— purpurascens, n. sp.	*								
Asopia limbolalis, n. sp.	*								
Leucinodes orbonalis	*								
Coptobasis andamanalis, n. sp.	*								
—— lunalis	*								
—— cuprealis, n. sp.	*								
Physematia concordalis	...	*							
Dichocrosis frenatalis	...	*							

Tabular List (continued).

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N.E. India.	S. India.	Ceylon.
Fam. *Hydrocampidæ*.									
Oligostigma sexpunctalis, n. sp.	*								
—— parvalis, n. sp.	*								
Fam. *Siculidæ*.									
Rhodoneura reticulalis, n. sp.	*								
—— tetraonalis, n. sp.	*								
—— marmorealis, n. sp.	*								
Fam Spilomelidæ.									
Phalangiodes neptisalis	*								
Pycnarmon obrinusalis	*								
—— discinotalis, n. sp.	*								
Conchylodes æriferalis, n. sp.	*								
Fam. *Margaronidæ*.									
Glyphodes actorionalis	*								
—— marginalis, n. sp	*								
Synclera cæsalis	*	...	...	...	...	...	*	*	*
Cydalima laticostalis	*	...	...	...	...	..	*		
Pachyarches maliferalis	*	...	...	...	...	...	*		
—— tibialis, n. sp.	*	...	...	...	...	...	*		
Auxomitia mirificalis	...	*							
Fam. *Botydæ*.									
Botys illisalis	*	...	...	...	...	...	*	...	*
—— multilinealis	*	...	...	...	...	...	*	...	*
—— scinisalis	*	...	...	...	...	...	*	*	
—— ardealis	...	*							
—— stultalis	*	...	...	...	...	...	...	...	*
—— thoasalis	*	...	...	...	...	...	*		
—— vinacealis, n. sp.	*								
—— abstrusalis	*	...	...	*	...	...	...	...	*
—— opalinalis, n. sp.	*								
—— immundalis	*	...	...	*					
CRAMBICES.									
Fam. *Galleridæ*.									
Propachys linealis	*	...	...	...	...	...	*		
URANIDES.									
Fam. *Nyctalemonidæ*.									
Nyctalemon najabula, n. sp.	*								
GEOMETRES.									
Fam. *Urapteridæ*.									
Urapteryx crocopterata	*	...	...	...	...	...	*		
Fam. *Ennomidæ*.									
Hyperythra lutea	*	...	...	*	...	...	*	...	*
Omiza affinis, n. sp.	*								

Tabular List (continued).

	Andamans.	Nicobars.	Sumatra.	Java.	Malay peninsula.	Burmah.	N.E. India.	S. India.	Ceylon.
Fam. *Boarmidæ*.									
Amblychia torrida, n. sp.	*								
Hypochroma perfectaria	*	...	...	...	...	...	*	*	
Bithia exclusa	*	...	...	...	...	...	*	...	*
Fam. *Geometridæ*.									
Thalassodes cælataria	*	...	...	...	...	...	...	...	*
Fam. *Palyadæ*.									
Eumelea ludovicata	*	...	...	...	...	...	...	...	*
Fam. *Acidalidæ*.									
Trygodes divisara	*	...	...	...	...	...	*	*	
Acidalia attentata	*	...	...	...	...	...	*		
—— remotata	*	...	...	...	...	...	*		
Zanclopteryx saponaria	*	...	...	...	*	...	*	...	*
Fam. *Micronidæ*.									
Micronia vagata, n. sp.	*								
—— obtusata	*	...	...	*	...	...	...	...	*
—— obliquaria, n. sp.	*								
Zomia pallida, n. sp.	*								
Fam. *Macaridæ*.									
Macaria nora	*	...	...	*	...	...	*	*	*
TORTRICES.									
Grapholitha novarana	...	*							
Choreutes novaræ	...	*							
TINEINES.									
Binsitta niviferana	*	...	...	...	...	...	*	*	
Blabophanes insularis	...	*							
Syme orbicularis	..	*							

EXPLANATION OF THE PLATES.

PLATE LVIII.

Fig. 1. *Mycalesis radza*, n. sp. p., 583.
2. *Abisara bifasciata* ♀, n. sp., p. 587.
3. *Danais melanoleuca*, n. sp., p. 581.
4. *Neptis mananda*, n. sp., p. 586.
5. *Myrina prabha* ♀, n. sp., p. 589.
6. *Amblypodia zeta* ♀, n. sp., p. 590.
7. *Hesperia colaca*, n. sp., p. 594.
8. —— *cahira* ♂, n. sp., p. 593.
9. *Pamphila gola* ♂, n. sp., p. 594.
10. —— *purreea*, n. sp., p. 594.
11. *Tagiades alica* ♂, n. sp., p. 593.

PLATE LIX.

Fig. 1. *Lælia venosa* ♂, n. sp., p. 601.
2. *Bizone amabilis* ♂, n. sp., p. 597.
3. *Eressa affinis*, n. sp., p. 596.
4. *Mahasena andamana* ♂, n. sp., p. 602.
5. *Hypsa andamana*, n. sp., p. 598.
6. *Philona cinerascens*, n. sp., p. 598.
7. *Ramadasa pavo*, Walk., p. 603.
8. *Pitasila leucospilota*, n. sp., p. 599.
9. *Achæa nubifera* ♂, n. sp., p. 609.
10. *Thalpophila cuprea*, n. sp., p. 604.
11. *Leucania costalis*, n. sp., p. 603.

PLATE LX.

Fig. 1. *Blenina grisea*, n. sp., p. 607.
2. —— *lichenosa*, n. sp., p. 607.
3. *Homodes crocea*, Guén., p. 605.
4. *Hypocala lativitta*, n. sp., p. 606.
5. *Mestleta duplexa*, n. sp., p. 611.
6. *Pleurona falcata*, Walk., p. 612.
7. *Hypena dentilinealis*, n. sp., p. 613.
8. *Hydrillodes subbasalis*, n. sp., p. 613.
9. *Pyralis trifascialis*, n. sp., p. 614.
10. *Rhodoneura tetraonalis*, n. sp., p. 617.
11. *Botys scinisalis*, Walk., p. 619.
12. *Oligostigma sexpunctalis*, n. sp., p. 616.
13. *Coptobasis cuprealis*, n. sp., p. 616.
14. —— *andamanalis*, n. sp., p. 615.
15. *Glyphodes marginalis*, n. sp., p. 618.
16. *Botys thoasalis*, Walk., p. 619.
17. *Micronia obliquaria* ♂, n. sp., p. 622.
18. —— *vagata*, n. sp., p. 622.

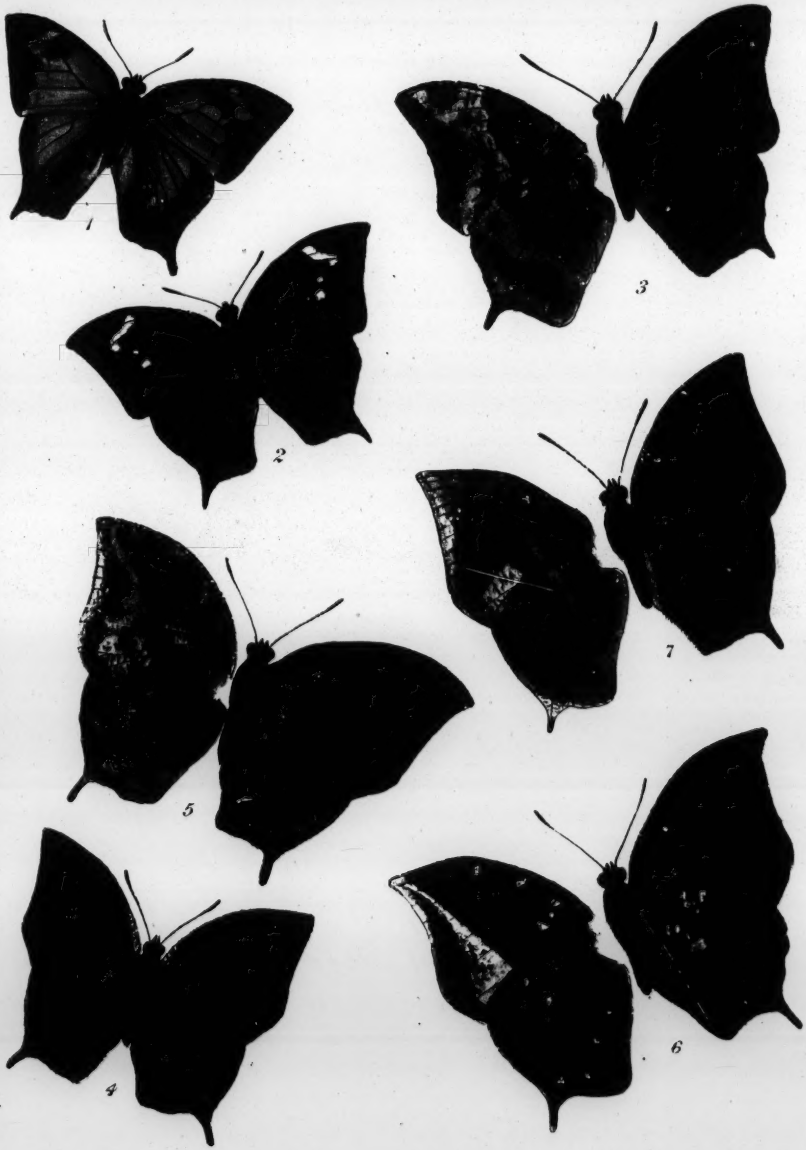
7. A Revision of the Lepidopterous Genus *Paphia*.

By HERBERT DRUCE, F.L.S., F.Z.S.

[Received June 7, 1877.]

(Plates LXI.–LXIV.)

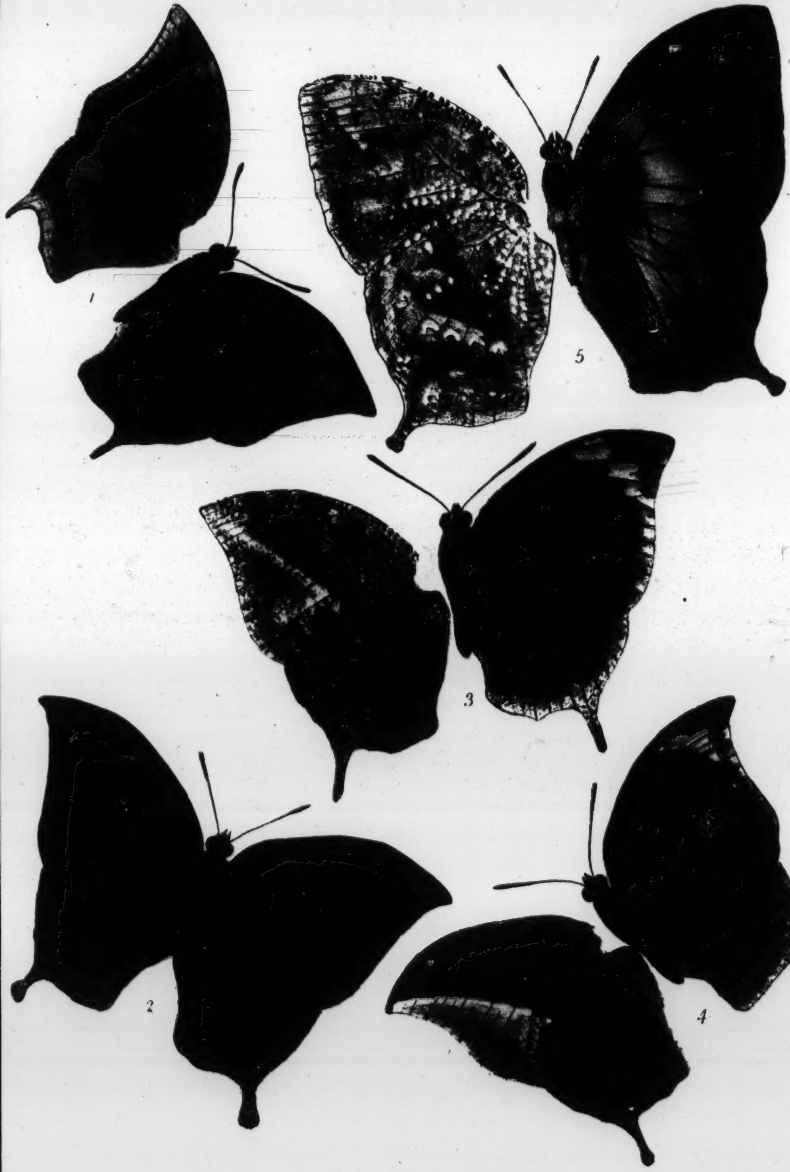
The last synopsis of this genus was made in 1850, in the 'Genera of Diurnal Lepidoptera.' The number of species at that time amounted to twenty-six; and in Mr. Kirby's Catalogue, published in 1871, we find the number brought up to fifty-three. Since then a large number have been described; and in addition to them, in the present paper I add descriptions of twenty-one new species, bringing the total number described up to ninety-five—nearly four times the number named in the 'Genera.' I find that in several instances species have been described two or three times over, and that others have been overlooked on account of the localities where the specimens were obtained not having been marked upon them. I have endeavoured in the following list to correct, as far as possible, all these errors; but in some few instances I have not been able to examine the types or figures of them; therefore I do not feel certain that all the species are placed in their right position.



R.H.F.Rippon lith.

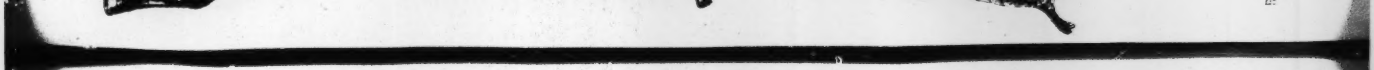
M & N Hanhart imp.

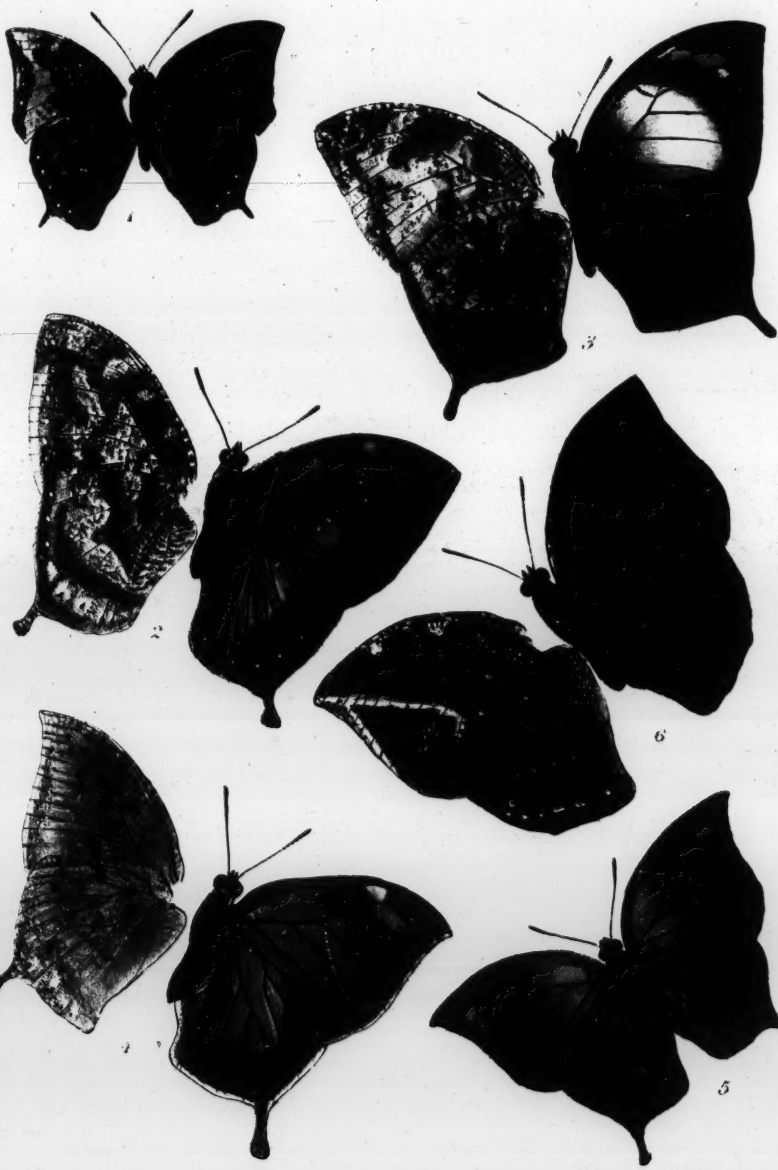
NEW SPECIES OF PAPHIA.



F. & F. Bauer, Lith.
M. & N. Hanhart, imp.

NEW SPECIES OF PAPHIA





R.H.Rippon lith.

NEW SPECIES OF PAPHIA.





West, Newman & Co. lith.

A. & G. Hanhart, imp.

NEW SPECIES OF PAPHIA.

The species of this genus are, with one exception, exclusively confined to the neotropical region, as defined by Mr. Sclater, the greatest number of species being found in the Brazilian subregion. They seem to take the place of the genus *Charaxes* of the Old World, and by some authors have been placed with them.

My best thanks are due to the following gentlemen—Messrs. Salvin and Godman, Dr. Staudinger, Mr. Hewitson, and Mr. Henley G. Smith, all of whom have allowed me free use of their extensive collections.

Subfamily NYMPHALINÆ.

Genus PAPHIA, Fab.

Paphia, Fabr. Ill. Mag. vi. p. 282 (1807); Westw. Gen. D. L. p. 317 (1850).

Nymphalis paphia, Latr. Enc. Méth. ix. p. 10 (1819); Feld. Neue Lep. p. 41 (1861).

1. P. TROGLODYTA, Fab. (*Pap. t.*) Syst. Ent. p. 502 (1775).

P. astinax, Cram. Pap. Ex. iv. t. 337. f. A, B (1782).

P. astina, Fab. Ent. Syst. iii. i. p. 81 (1793).

Hamadryas undata, Hübn. Samml. exot. Schmett. (1806–1816).

Hab. Haiti (*Tweedie*), Jamaica (*Cutter*). Mus. S. & G., D.

This species varies much in colour; some specimens are quite a deep red, others orange-red. It is peculiar to the West Indies.

2. P. PORTIA, Fab. (*Pap. p.*) Syst. Ent. p. 507 (1775).

Nymphalis portia, Godt. Enc. Méth. ix. p. 364 (1823).

Hab. Jamaica. Mus. S. & G.

Closely allied to the preceding species, of which it may be only a variety. It differs from *P. troglodyta* in the following respects:—the anterior wing is straighter and not crossed by the broken brown line; the lower half of the posterior wing is thickly speckled with brown scales.

3. PAPHIA OPS, sp. n.

Form of *P. aidea*. Upperside bright orange-red, the outer margins of all the wings mottled with brown. Underside pale grey-brown mottled with darker brown.

Hab. Texas. Mus. S. & G., D.

This is a rare species; I have only seen three specimens.

4. P. AIDEA, Guér. (*Thymetes? a.*) Icon. Règne Anim. Ins. texte, p. 478 (1829–1838).

The locality given for this species is Campeachy Bay. I have examined specimens from the following localities:—Oaxaca, Mexico (*Fenochio*); Mexico (*Boucard*), Guatemala (*Salvin & Godman*); Chontales Mines, Nicaragua (*T. Belt*). Mus. S. & G., D.

This species varies slightly; the Mexican specimens are darker-coloured than those from the other localities. In the central valleys of Guatemala this species is very common, but becomes scarce in Mexico and Nicaragua. I have not seen it from South America.

5. P. HALICE, Godt. (*Nymph. h.*) Enc. Méth. ix. p. 366 (1823).

Anœa halice Hübn. Zutr. Exot. Schmett. f. 967, 968 (1837).

Rio (*J. Youds*), Minas Geraes and St. Paulo (*Rogers*). Mus. S. & G.

Matto Grosso (*Beske*), Rio (*Burmester*). Mus. D.

The specimen from St. Paulo differs from all the others I have seen in having the whole of the wing suffused with a beautiful blue gloss. The range of this species seems confined to the southern part of Brazil.

6. P. CHRYSOPHANA, Bates, Ent. Mo. Mag. iii. p. 152 (1866).

P. pyrrhothea, Feld. Reise Nov. Lep. iii. p. 447, t. 60. f. 3 (1876).

Hab. Costa Rica (*Van Patten*); Veragua (*Arcé*); Panama. Mus. S. & G., D.

New Granada; Bogota (*Lindig.*). Mus. Felder.

East Peru (*Bartlett*). Mus. D.

The males of this species do not vary; but the female does, in the amount of yellowish-white markings on the anterior wing. This is a scarce species, Central America being its head quarters. I have only seen one specimen from Peru, which does not differ in any respect.

7. P. MORETTA, sp. n. (Plate LXI. figs. 1, 2.)

Form of *P. chrysophana*. Upperside—anterior wing of the male with the outer margin brownish black, not glossed with blue as in *chrysophana*, the basal part bright reddish brown, a black band from the costal margin to the end of the cell, from which a faint broken line crosses the wing to the anal angle; posterior wing brown, with the basal third reddish, slightly glossed with purple, three black spots between the base of the tail and the anal angle. Underside greyish, thickly irrorated with brown scales in some specimens, crossed beyond the middle by a waved brown band; both wings with a submarginal row of very minute white spots. The female is very like the female *P. halice* with all the white markings very small.

Exp. ♂ 1¾ inch, ♀ 2 inches.

Hab. Pernambuco. Mus. D.

A very distinct and beautiful little species.

8. P. RYPHEA, Cram. (*Pap. r.*) Pap. Ex. t. 48. f. G, H (1779).

Nymphalis ryphea, Godt. Enc. Méth. ix. p. 365 (1823).

Hab. Mountains of Oaxaca, east side (*Fenochio*); Polochic valley (*Hague*); Nicaragua (*T. Belt*); Costa Rica (*Van Patten*); Veragua (*Arcé*); Ecuador (*Simson*); Bolivia (*Buckley*); E. Peru (*Pearce* and *Whitely*); Venezuela (*Goering*). Mus. S. G. & D.

This species has a very wide range; the largest specimens are from Ecuador and Bolivia. It does not show any variation worthy of note, except that the tails of the hind wing vary much in size

and length. One of the specimens sent by Dr. Staudinger is almost without tails, and the red band at the apex of the anterior wing is very much smaller than usual, also the posterior wing is slightly dentated on the outer margin. I think it quite likely, when we know the larva and can get bred specimens, we shall find that *P. ryphea* and *P. phidele* are the same.

9. P. PHIDILE, Hübn. Ex. Schmett. Zutr. f. 905, 906 (1837).

P. erythema, Bates, Journ. Ent. ii. p. 343 (1865).

Hab. Costa Rica (*Van Patten*); Veragua (*Arcé*); Panama, New Granada, East Peru (*Whitely*); Santarem (*H. H. Smith*); North Brazil (*Beske*); S. E. Brazil (*Rogers* and *Vouds*). Mus. S. & G., D.

This species has a very wide range and varies to some extent. The specimens named by Mr. Bates I cannot distinguish in any way from Hübner's species. The specimens from Central America have the most colour on the posterior wing; in those from Peru and South Brazil the posterior wing is almost a dark brown. Some few specimens show indication of the tail on the posterior wing in the males, the same as *P. ryphea*. In fact it is difficult to say where one species stops and the other begins. I have a female from Pernambuco with a band of white spots across the underside of the posterior wing, but not differing in any other way.

10. P. HELIE, Linn. (*Pap. h.*) Syst. Nat. i. 2, p. 773 (1767); Clerck, Icones, t. 34. f. 3 (1764).

Nymphalis helie, Godt. Enc. Méth. ix. p. 365 (1823).

I know nothing exactly agreeing with the figure *Helie* in Clerck's Icones; I believe it to be a female either of *P. ryphea* or *P. phidile*; but for the present I think it better to keep them separate.

11. P. EURYPHILE, Feld. (*Nymphalis e.*) Wien. ent. Mon. vi. p. 119 (1862).

Hab. Cameta and Bahia. Mus. S. & G.

A very distinct species.

12. P. SOSIPPUS, Hopff. Stett. ent. Zeit. 1874, p. 352.

Hab. E. Peru.

I have not seen this species.

13. P. ANDRIA, Scudd. (*Anæa, a.*) Bull. Buff. Soc. ii. p. 248. n. 59.

I have not seen this insect.

14. P. CRATAIS, Hew. Desc. Bolivian Butt. p. 9 (1874).

Hab. Bolivia (*Buckley*). Mus. Hewitson.

This species is close to *P. glycerium*, but differs from it by its smaller size and by having a band of white spots across the underside of the posterior wing.

15. P. GLYCERIUM, Doub. & Hew. Gen. D. L. t. 50. f. i. (1850); Morr. Syn. Lep. N. America, i. p. 67 (1862).

Hab. Mexico (*Boucard*); Guatemala (*Salvin*); Nicaragua (*Belt* and *Janson*); Costa Rica (*Van Patten*); Chiriqui and Veragua (*Arcé*); New Granada, Venezuela (*Goering*). Mus. S. & G., D.

The Mexican specimens are the smallest and darker-coloured, agreeing best with those from New Granada and Venezuela.

16. P. ECHEMUS, Doub. & Hew. (*Cymatogramma, e.*) Gen. D. L. t. 49. f. 4 (1850).

Hab. Honduras. Mus. D.

This species is without doubt a *Paphia* closely allied to *P. verticordia*; it is still very rare in collections.

17. P. VERTICORDIA, Hubn. Zutr. Ex. Schmett. f. 559, 560 (1825).

Hab. Haiti (*Tweedie*). Mus. S. & G.

This species is only found in Haiti.

18. P. NOBILIS, Bates, Ent. Mo. Mag. i. p. 162 (1864).

Hab. Guatemala, St. Geronimo, Plain of Salamá (*Salvin & Godman*). Mus. S. & G., D.

This splendid species is only found in the central valleys of Guatemala, where it entirely replaces *P. nessus*, its nearest South-American ally.

19. P. NESSUS, Latr. (*Nymph. n.*) Humb. & Bonpl. Obs. Zool. ii. p. 76, t. 35. f. 5, 6 (1811–1823).

♀ *Nymphalis cleodice*, Feld. Wien. ent. Mon. v. p. 109 (1861).

♂ *Nymph. tempe*, Feld. I. C. p. 110 (1861), vi. p. 111 (1862).

Hab. Bogota; Cosnipata valley, East Peru (*Whitely*); Ecuador and Bolivia (*Buckley*); Venezuela (*Moritz*). Mus. S. & G., D.

This species has a very wide range, but does not vary except in the red spot on the posterior wing; in some specimens it is entirely wanting, in others it is very distinct. This variation is not confined to specimens from one locality. It is a very common species throughout South America.

20. P. NESEA, Godt. (*Nymph. n.*) Enc. Méth. ix. p. 365 (1823).

Nymphalis centaurus, Feld. Reise Nov. Lep. iii. p. 417, t. 60. f. 5 (1867).

Hab. Bogota, New Granada (*Birchall*). Mus. S. & G., D.

I have not seen a specimen of this species excepting from the above locality; it does not vary in the least. I have never seen the female, though the male is common and in most collections.

21. P. TITAN, Feld. (*Nymph. t.*) Reise Nov. Lep. iii. p. 447, t. 60. f. 4 (1867).

Hab. New Granada (*Birchell*); Costa Rica (*Van Patten*). Mus. S. & G., D.

This is a rare species. A specimen from Costa Rica is larger, and much darker-coloured than those from New Granada.

22. P. RUTILANS, Butl. Ann. & Mag. N. Hist. ser. 4, vol. xv. p. 223 (1875).

Hab. E. Peru (*Whitely*). Mus. B.

Very like *P. titan*, only smaller and without the tails to the hind wing.

23. P. TYRIANTHINA, Salv. & Godm. Ann. Nat. Hist. ser. 4. vol. ii. p. 148 (1868); Hew. Ex. Butt. iv. *Paph.* t. 2. f. 4, 1869.

Hab. Apolobamba, Bolivia (*Pearce*). Huasampilla, E. Peru (*Whitely*). Mus. S. & G., D.

This beautiful species is still very rare; the female is unknown.

24. P. CYANEA, Salv. & Godm. Ann. Nat. Hist. ser. 4, vol. ii. p. 148 (1868); Hew. Ex. Butl. iv. *Paph.* t. 2. f. 5, 9 (1869).

Hab. Canelos, Ecuador (*Pearce*). Cosnipata, E. Peru (*Whitely*). Mus. S. G.

Aguano, Ecuador (*Simson*). Mus. D.

This species is quite unlike any other *Paphia* with which I am acquainted; it is still very rare. I have only seen the five specimens that are in our collections, all of which are males.

25. P. ONOPHIS, Feld. (*Nymph. o.*) Wien. ent. Mon. v. p. 110 (1861).

P. onophis, Bd. Lép. Guat. p. 50 (1870).

Hab. Tablelands of Guatemala (*Salvin*); Costa Rica (*Van Patten*), Veragua (*Arcé*), New Granada (*Felder*), E. Peru (*Pearce*), Ecuador (*Buckley*). Mus. S. & G., D.

This species is common throughout a very wide range of country, and does not vary to any extent; the specimens from New Granada are the largest and rather greener in colour. A specimen in Messrs. Salvin and Godman's collection from Guatemala is almost without the blue spots on the anterior wing.

26. P. EUBÆNA, Boisd. Lép. Guat. p. 50 (1870).

I have not seen this species, but doubt its being distinct from *P. onophis*.

27. P. ARGINUSSA, Hübn. (*Corycia, a.*) Zutr. Ex. Schmett. f. 705, 706 (1832).

Hab. Minas Geraes (*Rogers*). Mus. S. & G.

This species is rare; I have only seen one specimen.

28. P. AMENOPHIS, Feld. (*Nymph. a.*) Reise Nov. Lep. iii. p. 449 (1867).

Hab. Guatemala (*Salvin*), New Granada (*Felder*), L. Amazons and E. Peru (*Whitely*). Mus. S. & G., D.

This is a well-marked species, but varies much on the underside:

in some specimens the dark brown markings are very distinct; in others they are almost wanting. A specimen in Dr. Staudinger's collection is much brighter blue than any I have seen. The type was from Bahia.

29. P. PITHYUSA, Feld. (*Nymph. p.*) Verh. zool.-bot. Ges. 1869, p. 473.

P. œnomais, Boisd. Lép. Guat. p. 51 (1870).

Hab. S. Mexico (*Boucard*), Guatemala (*Hague*), Veragua (*Arcé*, Costa Rica (*Van Patten*). Mus. S. & G., D.

The female of this species is much larger than the male, the base of the wings is bluer, and the spots on the anterior wing are larger and almost white. This is a scarce species, allied to *P. arginussa*, Hübn., of which I should consider it the Central-American representative.

30. P. HERBACEA, Butl. Cist. Ent. vol. i. p. 100 (1872).

Hab. Costa Rica (*Van Patten*). Mus. D.

A well-marked species belonging to the *Arginussa* group.

31. PAPHIA LEMNOS, n. sp. (Plate LXI. fig. 3)

Upperside blue-black: anterior wing the basal third dull blue, two blue spots near the apex, the first close to the margin, the second below and nearer the middle, followed by three spots in a straight line to the anal angle; the third is minute: posterior wing dull, blue from the base to the middle of the outer margin, a small white spot just above the tail, which is short and blunt. Underside rich brown; anterior wing crossed by two undulating bands of pale brown, thickly irrorated with dark brown, the first near the base quite narrow, the second beyond the middle extending to the apex and the anal angle, but not to the outer margin, which is dark brown; posterior wing crossed by two dark brown bands, the first from the middle of the costal margin to nearly the inner margin, the second from the apex to the anal angle, two small silvery spots on the middle of the costal margin.

Exp. 2 inches.

Hab. Chanchamayo, E. Peru (*Thamm*). Mus. Staudinger.

This is a well-marked species.

32. P. APPIAS, Hübn. (*Corycia a.*) Samml. ex. Schmett. (1816–1841).

Hab. Bogota (*Birchell*) S. Brazil (*Rogers*). Mus. S. & G., D.

The female of this species differs from the male in the same way as the sexes of *P. pithyusa*; it is a rare species, but most common in S. Brazil.

33. P. ARTACÆNA, Hew. Exot. Butt. iv. *Paph.* t. 2. f. 6, 7 (1869).

Hab. Choctum, Vera Paz. (*Hague*); Nicaragua (*Belt* and *Janson*), Veragua (*Arcé*). Mus. S. & G., D.

The type was from New Granada, and differs from the five speci-

mens that I have before me in wanting the white spot near the apex of the anterior wing, also in the much blacker colour of the underside. It is still a rare species, and in few collections.

34. P. ERIBOTES, Fab. (*Pap. e.*) Syst. Ent. p. 484 (1775); Don. Ins. Ind. t. 33. f. 3 (1800).

Nymphalis eribotes, Godt. Enc. Méth. ix. p. 356 (1823).
Paphia eribotes, Bates, Journ. Ent. ii. p. 340 (1865).
P. leonida ♀, Cram. Pap. Ex. iv. t. 388. f. E. F. (1782).
Hab. Para (*Bates*). Mus. S. & G.
Santarem (*H. H. Smith*), Guiana (*Deyrolle*). Mus. D.

There can be little doubt that Mr. Bates was quite correct in stating that the female is the species figured by Cramer; those sent by Mr. Smith agree with his specimens in every respect. This species is only found on the Lower Amazons.

35. P. PORPHYRIO, Bates, Journ. Ent. ii. p. 340 (1865).

Hab. Para, Santarem, Obydos, Tapajos (*Bates*). Mus. S. & G.

This is a very common species on the Lower Amazons; the specimen from Obydos differs from all the others by being much redder in colour on the outer margins of all the wings.

36. P. XENOCLES, Westw. Gen. D. L. p. 319, n. ii. note (1850).

Hab. Costa Rica (*Van Patten*), Chiriqui and Veragua (*Arcé*), New Granada (*Birchell*), Minas Geraes (*Rogers*), Venezuela (*Goering*). Mus. S. & G., D.

This species has a very wide range, but does not show variation to any extent; the specimens from Chiriqui are almost identical with those from Minas Geraes, and are brighter blue than those from New Granada &c.

37. P. OCTAVIUS, Fabr. (*Pap. o.*) Ent. Syst. iii. 1, p. 73 (1793); Don. Ins. Ind. t. 29. f. 2 (1800).

I have never seen this insect, and do not know any species in the least like the figure; it is said to come from India, which must, of course, be a mistake.

38. P. MORVUS, Fab. (*Pap. m.*) Syst. Ent. p. 484 (1775).

Nymphalis morvus, Godt. Enc. Méth. ix. p. 367 (1823).
Paphia morvus, Bates, Journ. Ent. ii. p. 341 (1865).
P. arachne, Cram. Pap. Ex. i. t. 48. f. A, B. (1779).
Anœa acidalia, Hübn. Verz. bek. Schmett. p. 48 (1816).
♀ *Paphia laertes*, Cram. Pap. Ex. i. t. 73. f. C, D (1779).
Nymphalis laertia, Godt. Enc. Méth. ix. p. 367 (1823).
Hab. Amazons (*Bates*). Mus. S. & G.
Chiriqui (*Ribbe*). Mus. Staudinger.

The specimen sent me by Dr. Staudinger is a little smaller than those from the Amazons, but otherwise the same. This species has a wide range, and varies to some extent.

39. PAPHIA FLORITA, n. sp. (Plate LXI. fig. 4.)

Upperside brownish blue, brightest at the base of all the wings; anterior wing, the apical half blackish with two small blue spots near the costal margin. Underside pale brown irrorated with brown and white scales; anterior wing crossed from the apex to the middle of the inner margin by an ill-defined white line; posterior wing darkest from the base to beyond the middle, with a submarginal row of six indistinct white spots.

Exp. $1\frac{3}{4}$ inch.

Hab. Chanchamayo (*Thamm*). Mus. Staudinger.

This species is close to *P. morvus*, but much smaller. It may be the Peruvian form of that species.

40. P. GLAUCE, Feld. (*Nymph. g.*) Wien. ent. Mon. vi. p. 119 (1862).

Paphia glauce, Bates, Journ. Ent. ii. p. 342, t. 13*. f. 2 (1865).

Hab. St. Paulo (*Bates*), E. Peru (*Whitely*), Santarem (*H. Smith*). Mus. S. & G., D.

A well-marked species allied to *P. xenocles*, but varies to some extent in colour, some specimens being more blue than others, also in the size of the spots near the anal angle of the anterior wing. The female is quite a different-looking insect, and has not been described. The upperside is dark brown with the base of all the wings violet-blue; the anterior wing has four white spots, the first beyond the middle on the costal margin, the second and third (which is minute) near the apex, and one below near the middle; posterior wing with a submarginal row of six or seven white spots, black on their outer margin. Underside, like the male, but much paler in colour.

41. P. GLAUCONE, Feld. (*Nymph. g.*). Wien. ent. Mon. vi. p. 119 (1862).

Hab. St. Paulo (*Bates*); Aguano, Ecuador (*Simson*). Mus. S. & G., D.

This species is still rare, and appears to be intermediate between *P. xenocles* and *glauce*.

42. P. CICLA, Moschl. (*Anœa c.*) Verh. z.-b. G. Wien, vol. xxvi. p. 319, t. 3. f. 10 (1876).

I have not seen this species, and do not feel sure I have put it in its right place.

43. P. HEDEMANNI, Feld. (*Nymph. h.*). Verh. zool.-bot. Ges. 1869, p. 473.

Hab. Potrero, Mexico (*Hedemann*). Mus. Vindob.

I have not seen this species, and cannot make it out from the description.

44. P. ALBERTA, Druce, P. Z. S. 1876, p. 234, pl. xviii. f. 6.

Hab. E. Peru. Mus. D.

I have only seen one specimen of this curious species; it is best

placed with the *Glauce* group, though in form it resembles *P. pasibula* without tails.

45. P. PRAXIAS, Hopff. Stell. ent. Zeit. vol. xxxiv. p. 355 (1874).

Hab. Peru.

I have not seen this species.

46. P. MŒRIS, Feld. (*Nymph. m.*) Reise Nov. Lep. iii. p. 449, t. 60. f. 2 (1867).

Hab. New Granada. Mus. S. & G., D.

Also in the collection of Dr. Staudinger, from Columbia. This species is a well-marked one; and so far as we know, it only occurs in New Granada. It is allied to *P. iphis*, but very distinct.

47. P. BEATRIX, Druce, Cist. Ent. vol. i. p. 287 (1874).

Hab. Chiriqui (*Arcé*). Mus. S. & G.

I have only seen a single specimen of this species; but it is very distinct from any other that I am acquainted with.

48. P. CLEOMESTRA, Hew. Ex. Butt. iv. *Paph.* t. 2. f. 8, 10 (1869).

Hab. Nicaragua (*T. Belt*), Veragua (*Arcé*). Mus. S. & G., D.

This fine species is still rare; I have only seen a few specimens.

49. P. IPHIS, Latr. (*Nymph. i.*). Humb. & Bonpl. Obs. Zool. ii. p. 80 (1833).

Nymphalis thamyris, Latr. *l. c.* t. 36. f. 3, 4 (1833).

Hab. Guatemala (*Salvin*), Nicaragua (*T. Belt*), Costa Rica (*Van Patten*), Chiriqui and Veragua (*Arcé*), Panama (*Boucard*), New Granada (*Birchell*), E. Peru (*Whitely*), Bolivia (*Pearce*), Upper and Lower Amazons (*Bates* and *Smith*). Mus. S. & G., D.

This species has a very wide range, and varies to some extent. I have examined a very large series from the above-given localities, and find that the specimens from Guatemala, Nicaragua, and Costa Rica are small, and in most instances the blue spots near the apex of the anterior wing are indistinct. Those from Chiriqui and Veragua are larger and become more like the typical form from New Granada, though they vary considerably in colour and the spots of the anterior wing. Three specimens in Dr. Staudinger's collection, labelled Columbia, are on the upperside much darker blue, and the spots almost gone; but on the underside they are the same. I do not consider this variation of any specific value; and, unless I were to make species by the score, which I do not think would be advisable, I must look upon them as differences caused by the influence of climate and food of the larva, &c.

50. P. ATES, n. sp. (Plate LXI. fig. 5.)

Upperside black, the basal third of the anterior wing, a spot on the costal margin beyond the middle, two below, nearest the apex, and two near the anal angle bright green; posterior wing greenish black,

brightest at the base, a submarginal row of small greenish-white spots. Underside dark brown, thickly irrorated with grey scales.

Exp. 2½ inches.

Hab. Bolivia (*Buckley*), Rio (*Beske*). Mus. Hewitson & Druce.

Also in the collection of Dr. Staudinger: his specimen is rather more blue than ours on the upperside. This species is near *P. iphis*, but quite distinct.

51. P. CEREALIA, n. sp (Plate LXI. fig. 6.)

Upperside dull greenish black, brightest at the base of the anterior wing, two green spots close to the apex, the first the largest. Underside bright chestnut-brown thickly speckled with white scales; anterior wing crossed from the apex to the middle of the inner margin by a whitish band, becoming wide and yellowish in colour near the anal angle; posterior wing with three white spots across the middle, all the wings with a submarginal row of minute white spots, and the outer margins greyish.

Exp. 2¼ inches.

Hab. Chanchamayo (*Thamm*). Mus. Staudinger.

52. P. PHILA, n. sp. (Plate LXI. fig. 7.)

On the upperside this species is like *P. ates*, but rather more blue; and on the underside it is the same as *P. odilia* with tails, but rather darker in colour.

Exp. 2 inches.

Hab. Bogota (*Nolcken*). Mus. Staudinger.

A most curious species.

53. P. BOLIVIANA, n. sp. (Plate LXII. figs. 1, 2.)

Upperside (*male*) deep bluish black, palest at the base of the anterior wing, a band of three small spots crossing the wing near the apex from the costal to the inner margin. Underside dark shining brown irrorated with a few greyish scales. *Female.* Upperside dark brown, with the base of all the wings bright violet-blue, the spots near the apex the same as in the male. Underside, the same as the male, but much paler brown, with three greyish spots between the tail and the anal angle.

Exp. ♂ 2½, ♀ 3 inches.

Hab. Bolivia (*Buckley*). Mus. Hewitson, Smith, and Druce.

A very distinct species; the spots on the anterior wing vary slightly in size.

54. P PSAMMIS, Feld. (*Nymph. p.*) Reise Nov. Lep. iii. p. 448 (1867).

Hab. Amazons and New Granada. Mus. Hewitson and B.M.

55. P. STHENO, Prittw. Stett. ent. Zeit. 1865, p. 142.

Hab. S.E. Brazil. Mus. S. & G., D.

I am indepted to Dr. Staudinger for kindly sending me the type of this species to compare with our specimens. The specimens from

Paraguay, in Mr. Salvin's collection, I cannot separate from this species.

56. P. OTRERE, Hübn. Zutr. Ex. Schmett. f. 407, 408 (1825).

Hab. Rio (*J. Yonds*). Mus. S. & G., D.

This is a very distinct and well-marked species.

57. P. UZITA, n. sp. (Plate LXIII. fig. 1.)

Upperside dark bluish black, glossed with dark blue, from the base of all the wings to beyond the middle. Underside dark brown irrorated with grey and white scales; anterior wing crossed from the apex to the anal angle by a band of reddish brown, narrow in the middle and broad at the anal angle; posterior wing crossed in the middle by a row of four reddish-brown spots.

Exp. 1½ inch.

Hab. Cayenne. Mus. Staudinger.

This is the smallest species of *Paphia* that I have seen.

58. P. PLEIONE, Godt. (*Nymph. p.*), Enc. Méth. ix. p. 366 (1823).

I have never seen this species; it is said to have come from the Antilles.

59. P. PHILUMENA, Doub. & Hew. Gen. D. L. t. 50. f. 2 (1850).

P. leuctra, Feld. (*Nymph. l.*), Wien. ent. Mon. vi. p. 119 (1862).

P. hauxwelli, Druce, Trans. Ent. Soc. 1874, p. 158.

Hab. St. Paulo (*Bates*), U. Amazons (*Hauxwell*), E. Peru (*Whitely*). Mus. S. & G., D.

This species varies much in size and colour; it is still rare in collections.

60. P. LORNA, n. sp. (Plate LXII. fig. 3.)

Upperside deep black; anterior wing greenish at the base, crossed near the apex from the costal to the outer margin, then nearly to the anal angle, by a broken grey-green band dentate on the inner margin; posterior wing with the outer margin and the tail grey-green, the fringe of all the wings white and brown. Underside dark glossy brown, thickly irrorated with grey scales, especially at the apex of the anterior wing.

Exp. 3 inches.

Hab. Bolivia (*Buckley*). Mus. Hewitson.

A fine and distinct species.

61. P. PLACIDA, n. sp. (Plate LXII. fig. 4.)

Upperside deep black-greenish at the base of the anterior wing. On the upperside this species is very like *P. lorna*, but differs in the following respects: the band of the anterior wing is smaller and close to the apex, it does not extend beyond the middle of the outer margin, where it is very narrow; the posterior wing the same as *P.*

lorna, with the grey-green margin not half the width. On the underside this species is a very different-looking insect, it is dark brown thickly irrorated with black, the anterior wing is crossed by a pale brown band from the apex to the middle of the inner margin; the posterior wing crossed in the middle by a row of four pale brown spots, the first close to the costal margin, the second in the middle, and the third and fourth close to the anal angle.

Exp. 2⅞ inches.

Hab. Bolivia (*Buckley*). Mus. Hewitson.

I am much inclined to think that this species will prove to be an extreme form of the last described, but for the present I think it better to give it a name.

62. P. GRANDIS ♀, n. sp. (Plate LXII. fig. 5.)

Upperside black; anterior wing, from the base to the middle, bright silvery blue, two small blue spots near the apex, the first close to the costal margin, the second below nearer the outer margin; posterior wing silvery blue from the base to beyond the middle, the tails with a few greyish scales. Underside bright ochreous yellow irrorated with white and brown scales; anterior wing, a dark brown band in the middle cell, and several dark spots between the end of the cell and the outer margin, which is whitish at the anal angle, and a submarginal row of minute white spots; posterior wing crossed beyond the middle by a waved indistinct silvery white line, a dark brown spot in the cell, and a submarginal row of white spots, the first two minute, the next three large, with black centres, the others minute, the tail dark brown.

Exp. 3¼ inches.

Hab.? Mus. Staudinger.

A very fine species; the underside is more easily figured than described. It is allied to *P. proserpina*.

63. P. OFFA, n. sp. (Plate LXIII. fig. 2.)

Upperside brownish black, from the base to the middle of all the wings pale blue; anterior wing crossed nearly to the outer margin by a band of pale blue; posterior wing with a submarginal row of minute white spots, the tail greyish. Underside bright reddish brown, thickly irrorated with white scales.

Exp. 2⅞ inches.

Hab. Ecuador. Mus. Hewitson.

A fine species allied to *P. grandis*.

64. P. CLUVIA, Hopff. Stett. ent. Zeit. vol. xxxiv. p. 354 (1874).

Hab. E. Peru.

I have not seen this species.

65. P. CATINKA, n. sp. (Plate LXIII. fig. 3.)

Upperside black; anterior wing from the base to beyond the middle bluish white, darkest at the base, a white band nearly

crossing the wing from the costal margin to the outer margin; posterior wing with the basal half bluish white. Underside brown, palest on the outer half of the anterior wing, thickly irrorated with brown scales.

Exp. $2\frac{3}{4}$ inches.

Hab. ? Mus. Hewitson.

A very distinct species, quite unlike any other with which I am acquainted.

66. P. MORTA, n. sp.

Upperside brownish black, the basal half of all the wings bright blue; on the upperside this species very closely resembles *P. offa* without the submarginal row of spots on the posterior wing. The underside is very different; it is pale greenish brown irrorated near the base of the anterior wing with a few white scales, both wings crossed beyond the middle from the apex to the abdominal margin by a waved band of pale ochreous colour.

Exp. $2\frac{1}{2}$ inches.

Hab. Corosal, Honduras (*Roe*). Mus. S. & G.

67. P. VICTORIA, n. sp. (Plate LXIII. figs. 4, 5.)

Upperside (*male*)—anterior wing black, from the base to the middle blue, two blue spots close to the apex; posterior wing glossy blue-black. Underside light olive-brown thickly irrorated with white scales. *Female* the same as the male, but larger, with the outer margin and the tails of the posterior wing greyish.

Exp. ♂ $2\frac{1}{4}$, ♀ $2\frac{1}{2}$ inches.

Hab. Rio (*J. Youds*). Mus. S. & G.

68. P. CHÆRONEA, Feld. (*Nymph. c.*) Wien. ent. Mon. v. p. 110 (1861); Reise Nov. Lep. iii. t. 60. f. 1 (1867).

Hab. New Granada (*Felder* and *Birchell*). Mus. S. & G., D.

This fine species is peculiar to New Granada. It does not vary in any way.

69. P. PROSERPINA, Salv. Ann. Nat. Hist. ser. 4, vol. iv. p. 181 (1869).

P. pedile, Druce, Cist. Ent. vol. i. p. 287 (1874).

Hab. Valley of the Polochic, Guatemala (*Hague*). Mus. S. & G.

Costa Rica (*Van Patten*). Mus. D.

One of the largest described species of *Paphia*.

70. P. INDIGOTICA ♂, Salv. Ann. Nat. Hist. ser. 4, vol. iv. p. 180 (1869).

P. zelica ♀, Salv. Ann. Nat. Hist. ser. 4, vol. iv. p. 180 (1869).

Hab. Costa Rica, ♂ (*Van Patten*); Chiriqui, ♂ (*Arcé*); Veragua, ♂ ♀ (*Arce*); Panama, ♂ (*Boucard*). Mus. S. & G., D.

This species is allied to *P. chæronea*, Feld., but quite distinct. I have little doubt that the specimen named *P. zelica* by Mr. Salvin is the

female of this species: the undersides are the same; but, above they are very different. Of the males we have a good series: but the female is very rare; I only know of three specimens.

71. P. XENICA, Bates, Ent. Mo. Mag. i. p. 163 (1864).

Hab. Polochic valley, Guatemala (*Salvin*). Mus. S. & G.

I have not seen the male of this species, but should expect it to be black, very like the male of *P. indigotica*.

72. P. BASILICA, Cram. (*Pap. b.*) Pap. Exot. iv. t. 329. f. E, F (1782).

Hab. St. Paulo (*Bates*). Mus. S. & G.

This is a rare species; I only know of the specimens taken by Mr. Bates.

73. P. PHANTES, Hopff. Stett. ent. Zeit. 1874, p. 353.

Hab. Chanchamayo, E. Peru (*Thamm*). Mus. Staudinger & Druce.

This species is close to *P. basilica*, Cr.

74. P. MEMPHIS, Feld. (*Nymph. m.*), Reise Nov. Lep. p. 448 (1867).

Hab. New Granada. Mus. Brit.

75. P. MORA, Druce, Cist. Ent. vol. i. p. 289 (1874).

Hab. Guatemala and New Granada. Mus. S. & G., Staudinger, D.

The Guatemala specimens are rather more purple in colour, but do not differ in any other respect.

76. P. CAMBYSES, n. sp.

Upperside deep black; anterior wing, the basal third bluish green, two small spots close to the apex green; posterior wing from the base to beyond the middle bluish green, a submarginal row of five indistinct green spots, the anal angle and the inner margin rufous brown. Underside dark rufous brown, thickly speckled on the anterior wing at the base, costal margin, and apex with greyish white scales; posterior wing, the base and inner margin irrorated with white, a submarginal row of minute white spots.

Exp. 3 inches.

Hab. Chanchamayo (*Thamm*), E. Peru (*Whitely*).
Mus. Staudinger and D.

77. P. LYCEUS, n. sp. (Plate LXIII. fig. 6.)

Upperside black; all the wings from the base to the middle bright azure-blue, a minute indistinct blue spot close to the apex. Underside rich brown thickly irrorated with greyish white scales; anterior wing crossed from the apex to the inner margin by a band of dark brown bordered outwardly with grey; posterior wing crossed by three indistinct bands of dark brown, the first close to the base, the second below the middle, and the third nearest the outer margin.

Exp. $2\frac{3}{4}$ inches.

Hab. New Granada, Ecuador. Mus. Staudinger, Smith, Druce.
A very distinct and beautiful species; the specimen in Mr. Smith's collection is the smallest I have seen.

78. P. ODILIA, Cram. (*Pap. o.*) Pap. Ex. iv. t. 329. f. C, D. (1782).

Papilio polycarmes, Fab. Syst. Ent. p. 484 (1775).
Nymphalis polycarmes, Godt. Enc. Méth. ix. p. 367 (1823).
Nymphalis odilia, Feld. Wien. ent. Mon. vi. p. 120 (1862).
Hab. Ega and St. Paulo (*Bates*). Mus. S. & G.
Bolivia (*Buckley*). Mus. Hewitson.
This is still a rare species.

79. P. NENIA, n. sp. (Plate LXIV. fig. 4.)

Upperside dull black, slightly shaded with purple at the base of the wings, and on the outer margin of the posterior wing. Underside glossy grey-brown, thickly irrorated with white scales.
Exp. 3 inches.
Hab. St. Paulo (*Rogers*). Mus. Hewitson & Smith.
On the upperside this species closely resembles *P. odilia*; but its greater size and very different underside at once show that it is a distinct species.

80. P. LAURA, n. sp.

Upperside dark greenish black, brightest at the base of the anterior wing. Underside rich chestnut-brown irrorated with silvery white scales; a large silver-white spot on the costal margin of the posterior wing nearest the apex, from which a waved band of white scales crosses the wing to the inner margin, and a submarginal row of minute white spots.
Exp. $2\frac{3}{4}$ inches.
Hab. Veragua (*Arcé*). Mus. S. & G.
On the upperside this is the darkest-coloured species with which I am acquainted.

81. P. ANASSA, Feld. (*Nymph. a.*) Wien. ent. Mon. vi. p. 120 (1862).

P. ada, Butler, Ann. Nat. Hist. ser. 4, vol. xv. p. 222 (1875).
Hab. Veragua (*Arcé*), New Granada (*Chesterton* and *Birchell*). Mus. S. & G., D.
A very distinct species.

82. P. LINEATA, Salv. Ann. Nat. Hist. ser. 4, vol. iv. p. 179 (Sept. 1869).

P. vestina, Hew. Equat. Lep. p. 31 (Dec. 1869).
P. betillina, Hopff. Stett. ent. Zeit. vol. xxxv. p. 354 (1874).
Hab. Apolobamba, N. Bolivia (*Pearce*). Mus. S. & G.
Ecuador (*Buckley*). Mus. Hewitson.
Chanchamayo (*Thamm*). Mus. Staudinger.
This is still a rare and little-known species.

83. P. AMBROSIA, Druce, Cist. Ent. vol. i. p. 288 (1874).

Hab. Chiriqui (*Arcé*). Mus. S. & G., D.

84. P. PHŒBE, n. sp. (Plate LXIV. fig. 1.)

This species is closely allied to *P. ambrosia*, but differs in the following respects:—The upperside is blacker and without the green scales at the base of the wings; the band near the apex and grey-green margin to the anterior and posterior wing is not broken into spots, as in *P. ambrosia*; the fringe is white instead of brown; the underside is much richer brown, with the markings as nearly as possible the same as *P. ambrosia*.

Exp. 3¼ inches.

Hab. Bolivia (*Buckley*). Mus. Hewitson.

A very fine species, sent by Mr. Buckley in his last collection.

85. P. POLYXO. (Plate LXIV. fig. 2.)

P. polyxo, Druce, Cist. Ent. vol. i. p. 288 (1874).

Hab. Rio (*Beske*). Mus. D.
R. Ucayali. Mus. S. & G.
E. Peru (*Thamm*). Mus. Staudinger.
Bolivia (*Buckley*). Mus. Hewitson and Smith.

86. P. AUREOLA, Bates, Ent. Mo. Mag. iii. p. 152 (1866).

Hab. Guatemala (*Salvin*). Mus S. & G., D.
New Granada (*Birchell*). Mus. Smith.

This is a splendid species, quite unlike any other. The female is very curious, having a broad white band across the anterior wing. It is still very rare.

87. P. PASIBULA, Doubl. & Hew. Gen. D. L. t. 50. f. 3 (1850).

Hab. New Granada (*Crowther* and *Birchell*). Mus. S. & G., D.

This species does not seem to occur out of New Granada; it is a common insect from Bogota.

88. P. FALCATA. (Plate LXIV. fig. 5.)

P. falcata, Hopff. Stett. ent. Zeit. 1874, p. 353.

Hab. Chanchamayo, E. Peru (*Thamm*). Mus. Staudinger.
Bolivia (*Buckley*). Mus. Hewitson.

A most beautiful species; allied to *P. pasibula*, but very distinct. The specimen sent by Mr. Buckley is smaller than Dr. Staudinger's.

89. P. XENOCRATES, Westw. Gen. D. L. p. 319. no. 13, note (1850); Ménétr. Cat. Mus. Petersb. Lep. ii. t. 9. f. 5 (1857).

Hab. E. Peru (*Whitely*). Mus. S. & G., D.

The four specimens of this species that I have examined are from Peru. The type is said to have come from Venezuela.

90. P. PANARISTE, Hew. Exot. Butt. i. *Paphia & Siderone*, f. 3 (1856).

New Granada (*Chesterton*). Mus. S. & G., D.

A very beautiful species, very unlike any other, and belonging to a little group almost entirely Central-American.

91. P. BERTHA. (Plate LXIV. fig. 3.)

P. bertha, Druce, Cist. Ent. vol. i. p. 359 (1875).

Hab. New Granada (*Chesterton*). Mus. D.

I have only seen a single specimen of this fine species.

92. P. JANSONI, Salv. Ann. Nat. Hist. ser. 4, vol. vii. p. 175 (1871).

Hab. Nicaragua (*Belt* and *Janson*). Mus. S. & G. and Hewitson.

93. P. EXCELLENS, Bates, Ent. Mo. Mag. i. p. 162 (1864).

Hab. Guatemala, central valleys (*Godman & Salvin*). Mus. S. & G., D.

This beautiful species is extremely rare; I only know of the specimens taken by Messrs. Salvin and Godman.

94. P. ELECTRA, Westw. Gen. D. L. p. 319. no. 12, note (1850); Hew. Ex. Butt. i. *Paphia* and *Siderone*, f. 1. 2. (1856).

Hab. Vera Paz (*Hague*); Polochic valley, Guatemala. Corosal, Honduras (*Roe*); Costa Rica (*Van Patten*); Chiriqui (*Arcé*). Mus. S. & G., D.

The Honduras specimen is the smallest I have seen. This species is the commonest of the group, and has a pretty wide range in Central America. I have not seen it from Mexico, Corosal being the most northern point from which we have received it.

95. P. CALLIDRYAS, Feld. (*Nymph. c.*) Verh. zool.-bot. Ges. 1869, p. 474.

Hab. Rio Polochic, Guatemala. Mus. S. & G.

A very curious species, reminding one at first sight of a *Callidryas*. It is extremely rare; I have only seen the single specimen in Messrs. Godman and Salvin's collection.

The last six species are very different from all the other *Paphiæ*; the bodies are more slender, the anterior wing is much more arched, and the apex terminates in a hook; the posterior wing has two tails. In form they very closely resemble *Hypna huebneri*.

The subjoined Table will show at a glance the distribution of the species of this genus of Lepidoptera.

	N. America: Texas.	Central America.								South America.										West Indies.		
		Mexico.	Guatemala.	Honduras.	Nicaragua.	Costa Rica.	Chiriqui.	Veragua.	Panama.	N. Granada.	Ecuador.	E. Peru.	Bolivia.	Chili.	Venezuela.	Guiana.	U. Amazons.	L. Amazons.	N. Brazil.	S. E. Brazil.	Cuba.	Jamaica.	Haiti.
Paphia troglodyta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	*	*
portia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	*	
ops	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
aidea	..	*	..	..	*																		
halice	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*			
chrysophana	..	..	..	..	..	*	..	*	*	*	..	*											
moretta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*				
ryphea	..	*	*	..	*	*	..	*	..	..	*	*	*	..	*								
phidile	..	..	..	..	..	*	..	*	*	*	.	*	..	..	..	..	..	*	*	*			
helie.																							
eurypyle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*				
sosippus	..	..	..	..	..	..	..	..	..	..	..	*											
andria.																							
cratais		..	..	..	..	..	..	..	..	..	..	..	*										
glycerium	..	*	*	..	*	*	*	*	..	*	..	..	..	..	*								
echemus	..	..	..	*																			
verticordia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*
nobilis	..	..	*																				
nessus	..	..	.	..	..	..	..	..	..	*	*	*	*	..	*								
nesea	..	..	..	..	..	..	..	..	..	*													
titan	..	..	..	..	..	*	..	..	..	*													
rutilans	..	..	..	..	..	..	..	..	..	..	..	*											
tyrianthina	..	..	..	..	..	..	..	..	..	..	..	*	*										
cyanea	..	..	..	..	..	..	..	..	..	..	*	*											
onophis	..	..	*	..	..	*	..	*	..	*	*	*											
eubœna	..	..	*																				
arginussa	..	..	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	..	*			
amenophis	..	..	*	..	..	..	..	..	..	*	..	*	..	..	..	..	..	*					
pithyusa	..	*	*	..	..	*	..	*															
herbacea	..	..	..	..	..	*																	
lemnos	..	..	..	..	..	..	..	..	..	..	..	*											
appias	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	*			
artacœna	..	..	*	..	*	..	..	*	..	*													
eribotes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	*					
porphyrio	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	*					
xenocles	..	..	..	..	..	*	*	*	..	*	..	..	..	..	*	..	..	..	..	*			
octavius																							
morvus	..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	*	*					
florita	..	..	..	..	..	..	..	..	..	..	..	*											
glauce	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	*	*					
glaucone	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	*						
cicla	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*				
hedemanni	..	*																					
alberta	..	..	..	..	..	..	..	..	..	..	..	*											
praxias	..	..	..	..	..	..	..	..	..	..	..	*											
mœris	..	..	..	..	..	..	..	..	..	*													
beatrix	..	..	..	..	..	..	*																
cleomestra	..	..	..	..	*	..	..	*															
iphis	..	..	*	..	*	*	*	*	*	*	..	*	*	..	..	..	..	*	*				
ates	..	..	..	..	..	..	..	..	..	..	..	..	*										
cerealia	..	..	..	..	..	..	..	..	..	..	..	*											

TABLE (*continued*).

	N. America: Texas.	Central America.								South America.									West Indies.		
		Mexico.	Guatemala.	Honduras.	Nicaragua.	Costa Rica.	Chiriqui.	Veragua.	Panama.	N. Granada.	Ecuador.	E. Peru.	Bolivia.	Chili.	Venezuela.	Guiana.	U. Amazons.	L. Amazons.	N. Brazil.	S.E. Brazil.	Cuba.	Jamaica.	Haiti.
Paphia																							
phila										*													
boliviana													*										
psammes										*							*						
stheno																			*	*			
otrere																				*			
uzita																	*						
pleione.																							
philumena												*					*						
lorna													*										
placida													*										
grandis.																							
offa											*												
cluvia												*											
catinka.																							
morta				*																			
victoria																				*			
chæronea										*													
proserpina			*			*																	
indigotica						*	*	*	*														
xenica			*																				
basilica																	*						
phantes												*											
memphis										*													
mora			*							*													
cambyses												*											
lyceus										*	*												
odilia													*				*						
nenia																				*			
laura								*															
anassa								*		*		*											
lineata											*	*	*										
ambrosia							*																
phœbe													*										
polyxo													*				*			*			
aureola			*							*													
pasibula										*													
falcata													*	*									
xenocrates													*										
panariste										*													
bertha										*													
jansoni					*																		
excellens			*																				
electra			*	*		*	*																
callidryas			*																				

EXPLANATION OF THE PLATES.

PLATE LXI.

Fig. 1, 2. *Paphia moretta*, p. 634.
3. —— *lemnos*, p. 638.
4. —— *florita*, p. 640.
5. *Paphia ates*, p. 641.
6. —— *cerealia*, p. 642.
7. —— *phila*, p. 642.

PLATE LXII.

Fig. 1, 2. *Paphia boliviana*, p. 642.
3. —— *lorna*, p. 643.
4. *Paphia placida*, p. 643.
5. —— *grandis*, p. 644.

PLATE LXIII.

Fig. 1. *Paphia uzita*, p. 643.
2. —— *offa*, p. 644.
3. —— *catinka*, p. 644.
Fig. 4, 5. *Paphia victoria*, p. 645.
6. —— *lyceus*, p. 646.

PLATE LXIV.

Fig. 1. *Paphia phœbe*, p. 648.
2. —— *polyxo*, p. 648.
3. —— *bertha*, p. 649.
Fig. 4. *Paphia nenia*, p. 647.
5. —— *falcata*, p. 648.

8. Description of a new Species of *Numida*. By A. D. BARTLETT, Superintendent of the Society's Gardens.

[Received June 19, 1877.]

(Plate LXV.)

Having had some correspondence with the owner of some Guinea-fowl (Mr. Gerald Waller) that were on their way to this country from East Africa, and having offered to take charge of them on their arrival, in order to restore them from the effects of the voyage, on the 4th of June I received five living birds, three Crested (*Numida cristata*) and two Vulturine (*N. vulturina*). Mr. Waller informed me that a sixth bird, which he believed to be a male, had died on the passage, and that the skin in a mutilated condition was then in his possession; and he kindly gave it to me upon my telling him it might prove to be a very interesting specimen.

On examining the skin, it struck me at once to be unlike any thing I had seen. I therefore examined the splendid work by Mr. Elliot, and came to the conclusion that I had found a new and hitherto undescribed species of *Numida*.

After a careful examination of Mr. Elliot's work, I wrote to Colonel Grant to ask if the figure of *Numida granti*, which came nearest to my bird, quite agreed with his original drawing. Colonel Grant has this day kindly shown me the original coloured drawing, and convinced me that the bird originally figured belonged to a species easily distinguished from the bird now before you, which, I have been informed by Mr. Waller, was obtained at Mombassa, on the east coast of Africa.

This bird differs from *Numida granti* (to which species it appears most nearly allied), by the entire absence of the *black ring* or *collar* and *black patch on front of the neck*. The whole of the *neck, breast, belly, back, upper* and *under tail-coverts* are finely and minutely *spotted with white on a black ground*.

The sketch (Plate LXV.) fairly shows the *colour of the face* and *wattles* at the *time it came into my hands*. I may state that the blue wattles differ considerably from the same parts in *N. cristata*, being *much longer* and falling *lower down*; the bird appears smaller than the last-named species.

It may be interesting to know that the three Crested birds that came, as Mr. Waller tells me, from Mozambique, differ from all the figures of *N. cristata* in having the throat up to the edge of the under mandible *covered with black feathers*. I consider them to be young birds, and that the throat will (as the birds become adult) lose these feathers and exhibit the naked red skin, so well marked in the figure in Mr. Elliot's work.

I propose the name of *Numida ellioti* for this new bird, after Mr. D. G. Elliot, F.Z.S., who has devoted so much time and attention to this interesting family.

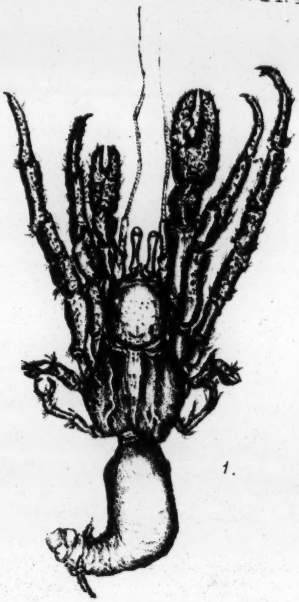


J.Smit lith.

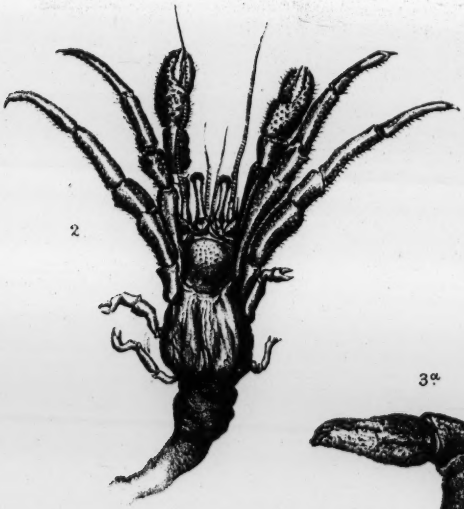
Hanhart imp.

NUMIDA ELLIOTI











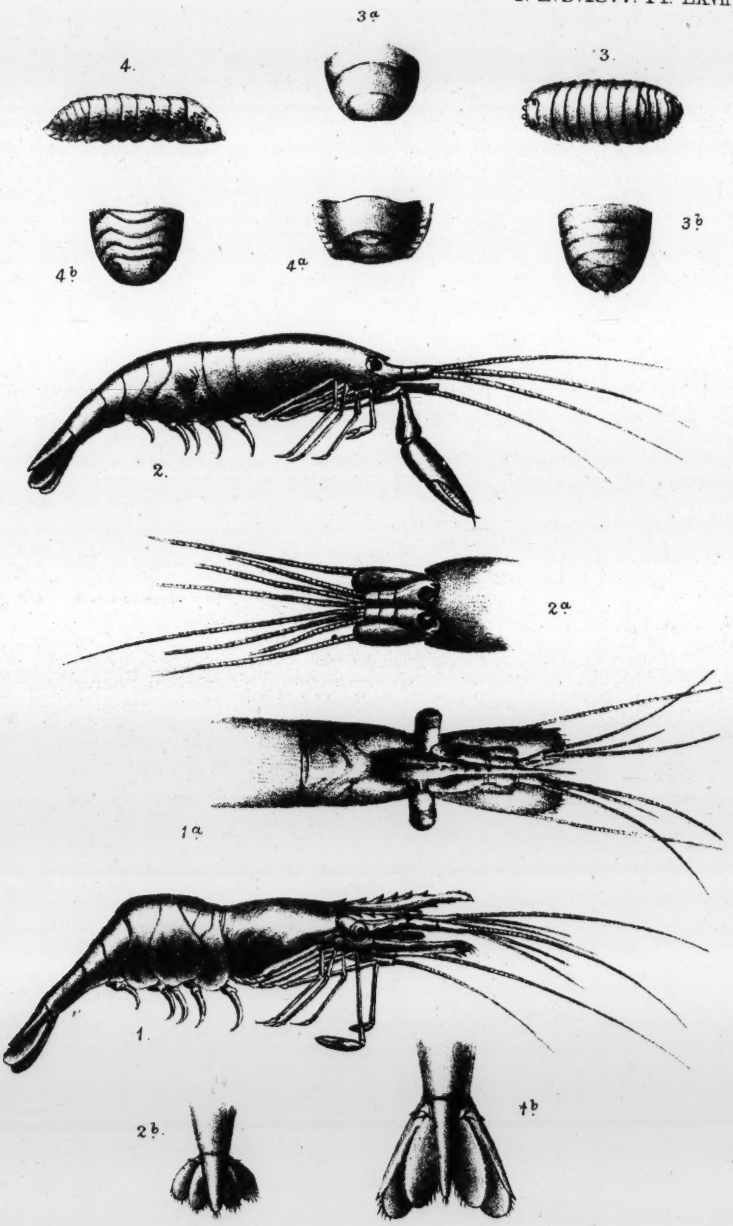


J. Carney del et lith.

Mintern Bros imp.

NEW SPECIES OF CLIBANARIUS.





J. Casey del. et lith. Mintern Bros imp.

NEW SPECIES OF DECAPODA & ISOPODA.





1b.



1c.



1.



1a.



4b.



2b.



4.



6.



2.



4a.



6a.



2a.



3b.



6c. 6b.



5a.



3.



3a.

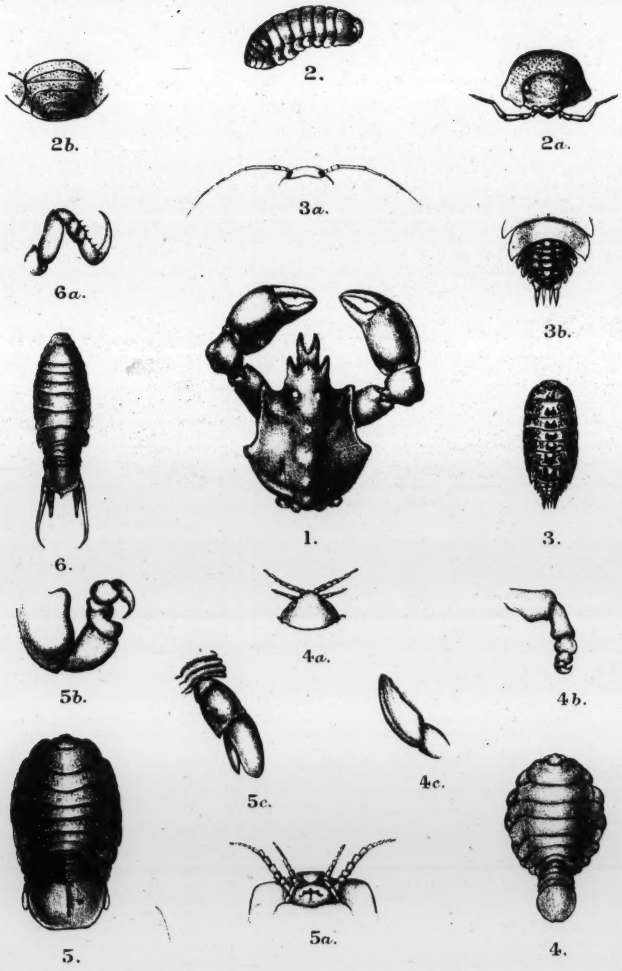


5.

E. Smith & C. Berjeau. lith. Mintern Bros. imp.

NEW SPECIES OF ISOPODA.

BRITISH MUSEUM
1 MAY 78



E. Smith & C. Berjeau. lith. Mintern Bros imp.

NEW SPECIES OF CRUSTACEA.

9. On a Collection of Crustacea, Decapoda and Isopoda, chiefly from South America, with descriptions of new Genera and Species. By Edward J. Miers, F.L.S., F.Z.S., Assistant in the Zoological Department, British Museum.

[Received June 13, 1877.]

(Plates LXVI.–LXIX.)

The greater number of the Crustacea described in the following paper were collected in Peru, Guiana, Cayenne and Martinique, and were sent by Professor A. Wrzesniowsky, of the University of Warsaw, to Dr. Günther, by whom they were intrusted to me for determination and description. The collection contained also a few Old-World species from various localities, which are described separately at the end of the paper. I have also added descriptions of species belonging to the same genera in the collection of the British Museum, which have hitherto been unrecorded, or known only from names without descriptions applied to them by A. White, in the 'List of Crustacea of the British Museum,' 1847.

In all, 37 species are noticed, of which 27 are from the New, and 10 from the Old World, viz. *Brachyura* 5 species, *Anomura* 7, *Macrura* 5, *Isopoda* 20. Of these 22 appear to have been hitherto undescribed, viz. *Brachyura* 1 species, *Anomura* 6, *Macrura* 2, *Isopoda* 13.

I have carefully noted such variations as I have observed between individuals of the same species—the nomenclature having often been needlessly encumbered by the description of nominal species, based only upon sexual or other differences, which the examination of a good series of specimens would have shown to be insufficient. I have also endeavoured to compare the species described with their allies, although in the case of the terrestrial and fluviatile Decapoda and terrestrial Isopoda this has generally been attempted only as far as their congeners inhabiting the same continent are concerned. Many, indeed, of the European Isopoda are only known to me by descriptions so short and superficial as to render their determination a matter of great difficulty, and their comparison with the New-World species described in the following paper impossible.

List of the Species described.

The names of the species in the collection from Warsaw are in Roman type, those described from specimens in the collection of the British Museum are in italics.

New-world Species.

DECAPODA.

Brachyura.

Acanthonyx petiverii, *M.-Edw.*? Peru.
Neptunus anceps, *Saussure*. Martinique.
Hepatus chilensis, *M.-Edw.* Peru.
—— *tuberculatus*, Saussure (adult). W. Indies, Cayenne.

ANOMURA.

Clibanarius cayennensis, n. Cayenne.
—— *carnescens*, n. ,,
—— *speciosus*, n. Brazil.
Clibanarius lordii, n. Vancouver Island.
—— *isochirus*. —?
—— *pilosimanus*. —?

MACRURA.

Palæmon nattereri, *Heller*. Guiana.
—— brasiliensis, ,, ,,
—— jelskii, n. ,,
Palæmon gaudichaudii, *M.-Edw.* Peru.
Euryrhynchus wrzesniowskii, n. Cayenne.

ISOPODA.

Armadillidium cælatum, n. Cayenne.
Armadillo vulgaris, *Latr.* ,,
Cubaris affinis, n. ,,
—— *gigas*, n. Nicaragua.
Porcellio cayennensis, n. Cayenne.
—— (Porcelloides) jelskii, n. Peru, Guiana.
Porcellio (Porcelloides) flavo-vittata, n. Cayenne.
—— (——) aztecus, *Saussure*. Peru.
Philougria nitida, n. Peru, Guiana.
Lygia baudiniana, *M.-Edw.* Cayenne.
Cymothoa œstrum, *L.* Peru.
Anilocra lævis, n. Martinique, Peru.

Old-world Species.

DECAPODA.

BRACHYURA.

Acanthonyx elongatus, Red Sea.

ANOMURA.

Clibanarius misanthropus, *Risso*.

ISOPODA.

Tylos latreillei, *Audouin*. Odessa.
—— *granulatus*, n. Japan, Borneo.
Armadillidium pustulatum. *Dum.* Moldavia.
Porcellio swammerdamii, *Audouin*, Egypt.
Porcellio hispida, n. Mongolia.
Lironeca daurica, n. Dauria.
Lironeca laticauda, n. Mantchuria.
Anilocra trichiura, Mauritius.

New-world Species.

DECAPODA.

BRACHYURA.

ACANTHONYX, Latreille.

ACANTHONYX PETIVERII ?

Cancer muricatus compressus, Petiver, Pterigraphia Americana, pl. xx. fig. 8.

Acanthonyx petiverii, M.-Edw. Hist. Nat. Crust. i. p. 543 (1834); Dana, U.S. Expl. Exp. xiii. Crust. (part i.), p. 128, pl. v. fig. 6 (1852); Guérin-Méneville in Ramon de la Sagra, Histoire de l'Isle de Cuba, Crust. p. xxvii (1857); v. Martens, Archiv f. Nat. xxxviii. p. 85 (1872).

Hab. Peru.

In all the specimens the teeth of the lateral margins are clothed with tufts of short hairs. In one or two specimens there are two small tufts upon the gastric region; in the others these are entirely absent. The median tooth of the lateral margin is always much nearer to the posterior than to the anterior tooth; the anterior tooth is somewhat less prominent in the youngest specimens. In the males

the hands are very large, compressed, and slightly cristate; in the females they are small but compressed.

There are eight males and three females in the collection. Length of adult male 1 inch 2 lines, breadth 9 lines.

This species, if the determinations of authors are correct, is one of the few that are common to the eastern and western shores of the American continent. It has been recorded by Milne-Edwards, Guérin-Méneville and v. Martens from the West Indies, by Professor Bell from the Galapagos and Brazil, and by Dana from the coast of Chili. Only a single young specimen from the West Indies is in the collection of the British Museum; but this does not seem to differ specifically from examples from the eastern coast.

The original specimen of Petiver was from the West Indies; but his figure is not sufficiently accurate to be available for specific comparison.

This species very closely resembles the European *A. lunulatus*, Risso, but may be distinguished from it by its narrower and less deeply emarginate front, the form of the hands, which are slightly cristate above, and by the shorter, broader, and more dilated penultimate joints of the ambulatory legs.

Acanthonyx debilis, Dana, U.S. Expl. Exp. xiii. Crust. i. p. 125, pl. v. fig. 5 (1852), from Valparaiso, differs in the non-cristate wrist and small hands of the males. *A. concamerata*, Kinahan, Journ. Roy. Dublin Soc. i. p. 334, pl. xiv. fig. 1 (1858), from the North Cinchas Island, Peru, has, if the figure be correct, the anterior lateral angles of the carapace rounded and far less prominent. *A. emarginatus*, M.-Edw. and Lucas, in D'Orbigny, Voy. Amér. Mérid. p. 9, pl. v. fig. 2, from Peru, has also the first tooth or antero-lateral lobe far less prominent, the anterior margin of the carapace straight, and the hands more strongly cristate.

Neptunus, De Haan.

Neptunus anceps.

Lupea anceps, De Saussure, Rev. et Mag. Zool. (sér. 2) ix. p. 502 (1857); Mém. Soc. Phys. et Hist. Nat. Genève, xiv. (part 2) p. 434, pl. ii. fig. 11 (1858).

Neptunus anceps, A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. x. p. 328 (1861).

Hab. Martinique.

The length of the single specimen in the collection (a male), is 7 lines, the breadth at base of epibranchial spine 10 lines.

The specimen from Martinique differs in some few particulars from De Saussure's description, which was founded upon a very small example. He says that there *ten* spines upon the antero-lateral margin; only *nine* are shown in the figure, including the external orbital spine. In very young specimens of this genus, however, it is not uncommon to find one or two additional spines upon the antero-lateral margins. There is, according to De Saussure, a second spine at the distal extremity of the superior margin of the hand;

this is scarcely apparent in the larger specimen from Martinique, and may also be due to the immaturity of the specimen examined by him. *N. anceps* is nearly allied to *N. hastatus*, from the Mediterranean, from which it differs in the shorter, more obtuse median frontal teeth, &c., and to *N. laevis*, A. Milne-Edwards, from the Indian Ocean, in which the carapace is nearly smooth, and the median teeth of the front slightly prominent and acute.

Lupea exasperata, Gerstaecker, Archiv f. Nat. xxii. p. 129 (1856), from Puerto Cabello, has the median teeth of the front separated by a deeper fissure, and the last spine of the antero-lateral margins but little longer than the preceding. *L. pudica*, Gerst. *l. c.* p. 130, from the coast of Brazil, has the upper surface of the carapace nearly smooth, and glabrous; the arm blunt and without a spine at the distal extremity of its posterior margin.

This species has been united by von Martens, Archiv f. Nat. xxxviii. p. 95 (1872), with *Lupea forceps*, Fabricius, on the authority of a large series of specimens from Cuba, in which von Martens observed a great increase of length in the anterior legs as the animal increased in age. I believe it to be quite impossible that *L. anceps* can be identical with *L. forceps*, as described and figured by Leach, Zool. Miscell. i. pl. liv. (1814), and Alph. Milne-Edwards, Arch. Mus. Hist. Nat. x. p. 352, pl. xxviii. fig. 1 (1861). In Leach's typical specimen of *L. forceps* in the British-Museum collection, not only are the fingers very slender and more than three times the length of the palm, but the carapace is strongly granulated, the frontal teeth acute and separated at base by wide intervening spaces; there is a very deep fissure in the middle of the upper orbital margin (a mere notch in *L. anceps*), five spines upon the anterior margin of the arm in *N. anceps*, seven in *L. forceps*, the meros joint of the fifth pair of legs without spines in *L. anceps*, with two spines in *L. forceps*, &c.

Lupa bellicosa, Stimpson, quoted by M. A. Milne-Edwards, *l. c.*, as a synonym of this species, is the *Callinectes bellicosus* of Ordway, and has probably nothing to do with *N. anceps*.

Hepatus, Latreille.

Hepatus chilensis.

Hepatus chiliensis, M.-Edwards, Hist. Nat. Crust. ii. p. 117 (1837).

Hepatus chilensis, M.-Edwards and Lucas, in D'Orbigny, Voy. Amérique mérid. vi. part i. Crust. p. 28, pl. xiv. fig. 1 (1843); Nicolet, in Gay, Historia de Chile, Zool. iii. Crust. p. 174 (1849); Dana, U.S. Explor. Exped. xiii. Crust. part i. p. 395, pl. xxv. fig. 3 (1852); Kinahan, Journ. Roy. Dublin Soc. i. p. 345 (1858); Heller, Reise der Novara, Crust. p. 70 (1865).

Hab. Peru (*Jelski*).

Two specimens (male and female) are in the collection.

This species appears to be subject to considerable variation in the sculpture of the antero-lateral margins and the coloration of the

carapace. M. Milne-Edwards says of it, "*les bords latéro-antérieurs sont uniformément dentelés sans être crénelés ; couleur rouge, uniforme.*" The remarks upon this species in Gay's 'Historia de Chile,' coincide with this description.

The specimens described by Dana, collected at Valparaiso, were of "a yellowish or ochreous base closely covered with a brownish-purple reticulation;" and this is nearly the colour of the figure of MM. Milne-Edwards and Lucas in D'Orbigny's 'Voyage dans l'Amérique méridionale," and of a specimen (dry) in the collection of the British Museum. Other specimens (dry) in the Museum collection are of a nearly uniform pink colour, with narrow sinuated light-yellow spots and lines; and this also is the colour of the specimens from Peru, in spirits.

The broad truncate teeth of the antero-lateral margins are more or less crenulated in all the specimens that I have seen; and Milne-Edwards's description is certainly inaccurate in this respect, as was first noted by M. Herklots, in his comparison of this species with his *H. van benedeni* (itself the *H. decorus* of Herbst), Bijdragen tot Dierkundige. Abh. v. p. 35 (1852)[1].

Anomura.

Clibanarius, Dana.

Clibanarius cayennensis, sp. n. (Plate LXVI. fig. 1).

Carapace flattened; anterior margin more prominent and straight at the bases of the eyes, oblique on each side at bases of external antennæ, with a small median frontal tubercle, and with a transverse nearly semicircular suture behind the anterior margin. Eye-peduncles very slender, and nearly as long as the anterior margin of the carapace, their basal scales short and denticulated on their antero-external margins; basal scale of the external antennæ about reaching to the extremity of the penultimate joint of the peduncle. Anterior legs stout, the right the largest, hands rather finely granulated and clothed towards the tips with short stiff hairs, the palms somewhat swollen at base, the fingers excavated, with black corneous tips, and opening horizontally (as in all the species of the genus). Tarsi of the second and third pairs of legs longer than the penultimate joint, subcylindrical, slightly curved, with a small, black, terminal nail, and thinly clothed with short brown hairs. Fifth pair of legs much more slender than the fourth. Colour uniform yellowish-brown.

Hab. Cayenne.

[1] *Hepatus tuberculatus* of Saussure, from Guadeloupe, is evidently founded upon an immature example; the transverse tuberculated ridges mentioned in his description are generally prominent in the young of other species, as for example, *H. angustatus*, Fabricius, of which there is a large series in the national collection, from Brazil. Specimens of a species from the West Indies and Cayenne, in the British-Museum collection, which I think may be the adult *H. tuberculatus*, are very closely allied to the *H. angustatus*, being in fact only distinguished from it by the coloration: in *H. angustatus* the markings form brownish-pink spots and blotches; in the specimens I refer to *H. tuberculatus* they consist of purplish-pink spots, usually forming more or less continuous transverse lines.

This species, of which unfortunately but a single specimen exists, in bad condition, is distinguished by the unequal-sized hands and the coloration (there being no trace whatever of banded markings on the legs) from the other American species of the genus. The abdomen is imperfect. In the form of the hands it most nearly resembles *C. vittatus*, Bosc, of which specimens from Charleston Bay, Carolina, are in the national collection, presented by the Smithsonian Institution.

The following American species of this genus in the collection of the British Museum are apparently undescribed.

CLIBANARIUS CARNESCENS, sp. n. (Plate LXVI. fig. 2.)

Carapace with the frontal median tooth very small, acute. Eye-peduncles slender, and a little shorter than the anterior margin of the carapace, their basal scales small, and denticulated on their external margins. External antennæ with their basal scales denticulated on their inner margins, and ciliated towards their apex, reaching very little beyond the extremity of the penultimate joint. Anterior legs with the hands very small, oblong-oval, and not broader than the wrists, with strong scattered granules, and tufts of short hairs. Ambulatory legs with the tarsi very long, curved, not compressed, much longer than the penultimate joints, with tufts of short hairs. Colour orange-pink, with 4 broad alternating vittæ of darker colour on the legs. Length to base of abdomen 9 lines.

Hab. Cayenne. (Coll. Brit. Mus.)

CLIBANARIUS SPECIOSUS, sp. n. (Plate LXVI. fig. 3.)

Carapace with a very small acute median frontal tooth, and with the anterior margin but slightly oblique at the bases of the external antennæ, postfrontal suture nearly obsolete. Eye-peduncles slender, and about as long as the frontal margin of the carapace, with their basal scales small, narrow, and denticulated on their inner margins toward the apex. External antennæ with the last joint of the peduncle more than twice as long as the penultimate, and with the basal scale slender, reaching a little beyond the extremity of the penultimate joint. Anterior legs with the hands oblong-oval, equal, rather closely and finely granulated, and clothed with short hairs. Tarsi of the second and third pairs of legs longer than the penultimate joint, with longitudinally-seriate close-set tufts of rather long hairs. Colour grey, or chocolate-brown (in dried specimens); ambulatory legs with eight longitudinal whitish narrow vittæ. Length of carapace 1 inch.

Hab. Brazil. (Coll. Brit. Mus.)

It differs from *C. brasiliensis*, Dana, U.S. Expl. Exp. Crust. p. 467, pl. xxix. fig. 7, in the much longer tarsi.

CLIBANARIUS LORDI, sp. n. (Plate LXVI. fig. 4.)

Resembles the preceding species in coloration &c. The ophthalmic scales, however, are very small, ovate-acute, and entire; the basal scales of the external antennæ very short, not reaching to the ex-

tremity of the penultimate joint of the peduncle; the hands narrow oblong-oval, with small spiniform tubercles. The sides of the carapace, legs, and basal scales of the external autennæ clothed with long light fulvous hairs. Length of carapace about 1 inch.

Hab. British Columbia, Vancouver Island. (Coll. Brit. Mus.)

A single specimen presented by J. K. Lord, Esq., is in the national collection. It is labelled "*Clibanarius lineatus*," but is certainly not the species described under that name by Milne-Edwards, Ann. Sci. Nat. (ser. 3) v. p. 62 (1848), and figured by Dana, U.S. Expl. Exp. Crust. i. p. 462, pl. xxix. fig. 2 (1852), from the Samoan Islands[1].

PAGURUS? sp.

With *C. cayennensis* a specimen was sent that, I think, must be referred to the restricted genus *Pagurus*, on account of the short, thick eye-peduncles; but as the anterior legs are both wanting, it cannot be referred with absolute certainty to any one of the genera of the family Paguridæ. I cannot identify it at present with any species known to me, and refrain from giving it a distinct specific designation, on account of its mutilated condition. The eye-peduncles are much shorter than the anterior margin of the carapace, their basal scales small, ovate-acute, and entire. The basal scale of the external antennæ is long, slender, nearly as long as the peduncle of the external antennæ, and longer than the eyes. The second and third legs have the antepenultimate and penultimate joints short, subequal, shorter than than the tarsi, granulous or even spinose on their upper margin, tarsi long, twisted and channelled. This species somewhat resembles *Eupagurus obesocarpus*, Dana (U.S. Expl. Exp. xiii. Crust. i. p. 445, pl. xxvii. fig. 5), from Valparaiso (?), but differs in the shorter eyes and much longer acicle of the external antennæ.

Hab. Cayenne.

MACRURA.

PALÆMON, Fabricus.

The species of this genus are very numerous and are found in all parts of the world, inhabiting both salt, brackish, and fresh water. Their determination is a matter of great difficulty, on account of the changes which the animal undergoes as it increases in age. The

[1] The *Pagurus isochirus*, named but not described by White (List Crust. Brit. Mus. p. 59, 1847), belongs to this genus, and is founded upon a single specimen of unknown locality in the British-Museum collection. This specimen generally resembles *C. carnescens*, but is of a uniform light-yellow colour, without spots or vittæ, inclining to orange at the extremity of the tarsi. Length nearly 1 inch.

Pagurus pilosimanus, White (*l. c.* p. 60), also founded upon a single specimen of unknown habitat, belongs, I think, to this genus, but is in too mutilated a condition for detailed description. It is, however, remarkable for the great length of the eye-peduncles, which are about once and a half the length of the anterior margin of the carapace, with a small spiniform basal scale, and a broad crimson vitta. The anterior legs are now wanting in this specimen. Length about 1 inch.

teeth of the rostrum are variable in number in different examples of the same species; and even the comparative length of the joints of the second pair of legs (which affords excellent specific characters when taken from adult animals) is less trustworthy in younger specimens.

After having examined a considerable number of species of this genus, I may express my belief that some of them—perhaps some even of those included in the present paper—will, upon comparison of larger series of specimens than we at present possess, be found to represent merely different stages of growth of the same animal. Dr. von Martens, in two papers in the Archiv f. Naturgeschichte, xxxiv. p. 34 (1868), and xxxv. p. 32 (1869), has done good service toward elucidating this difficult genus by exhibiting in a tabulated form the diagnostic characters of the species inhabiting the Eastern-Asiatic Region, and South Brazil.

PALÆMON NATTERERI.

Palæmon nattereri, Heller, Kais. Akad. Wissensch. Sitzungsber. xiv. Abth. i. p. 414, pl. ii. fig. 36, 37 (1862); von Martens, Archiv f. Naturg. xxxv. p. 32 (1869).

Hab. Guiana (river St. Laurent) (*Jelski*).

This species was described by Heller from specimens collected by Natterer in the Rio Negro, Brazil. It is distinguished from its congeners from the American continent by the elongated, strong, second pair of legs, which are closely spinulose, and of rather unequal size; the palm is much longer than the wrist; the upper (mobile) finger has two, the lower a single strong tooth on its inner margin. The sides of the carapace below the hepatic spine are very rough and scabrous to the touch. Two specimens are in the collection, which I refer to this species: in the larger (length to anterior margin of carapace 2 inches) the rostrum is imperfect; in the smaller the rostrum $1\frac{1}{4}$ is toothed. In the smaller specimens; as is always the case in the species of the genus *Palæmon*, the distinctive characters are far less strongly marked.

PALÆMON BRASILIENSIS.

Palæmon brasiliensis, Heller, Kais. Akad. Wissensch. Sitzungsb. xiv. Abth. i. p. 419, pl. ii. fig. 46 (1862); von Martens, Archiv f. Naturg. xxxv. p. 32 (1869).

Hab. Guiana (R. St. Laurent) (*Jelski*).

Three specimens of this species are in the collection; the length of the largest is 1 inch 10 lines to tip of rostrum. Two specimens agree well with the figure and description of Dr. Heller, whose specimens were collected by Natterer in a brook at Camaroës, in Brazil. It is to be noted, however, that the second pair of legs, which he describes as unequal, are, in the specimens from Guiana, very nearly of equal length.

This species was found *in the same stream with the preceding*. The legs are not so robust, and more minutely spinulose, the palm

but little longer than the wrist; fingers slender, without strong teeth on their inner margins; the sides of the carapace, below the lateral hepatic spine, are nearly smooth.

The third and smallest specimen (length to tip of rostrum 1 inch 5 lines) differs from the preceding in having thirteen teeth on the upper margin of the rostrum, the three apical teeth being somewhat smaller and more crowded, as in *P. montezumæ*, Saussure, from the Gulf of Mexico; the wrist of the second pair of legs is not, however, shorter than the palm, as in that species. This I regard merely as a variety of *P. brasiliensis*.

Although it may be well, in the present state of our knowledge, to maintain *P. nattereri* and *P. brasiliensis* as distinct species, the differences existing between them are very slight, scarcely sufficient for specific distinction, if regard be had to the identity of locality and the variations that are known to exist in individuals of a single species.

This and the preceding species are omitted by Smith in his list of the known species of Brazilian Decapoda (Trans. Conn. Acad. ii. p. 40, 1870).

PALÆMON JELSKII, sp. n. (Plate LXVII. fig. 1.)

Slender, smooth, with the lateral margins of the segments of the abdomen straight. Rostrum very long and slender, reaching beyond the end of the basal scale of the external antennæ, at base rising considerably above the dorsal surface of the carapace, apex slightly directed upward; upper margin with 6–7 teeth towards the base, and three small and crowded at apex, lower margin with 7 teeth. Eyes large. Antennules with the peduncles reaching considerably beyond their basal scales, but not to the extremity of the basal scale of the antennæ; longest flagella very slender, about as long as the animal; antennæ with the peduncles short, not reaching halfway to extremity of basal scale; flagella extremely long and slender, longer than the animal. Second pair of legs filiform, no thicker than the rest, and not much longer than the carapace and rostrum; wrist very long and slender, about twice as long as the hand, which has the palm and fingers equal, fingers hairy. Length about 1 inch 8 lines.

Hab. Guiana (Oyapok) (*Jelski*).

This species is evidently very nearly allied to *P. amazonicus*, Heller, Sitzungsb. *l. c.* p. 418, pl. ii. fig. 4, 5 (1862); but it differs in the fewer teeth upon the lower margin of the rostrum, which is less raised at the extremity, and the far longer wrist of the second pair of legs.

In the form of the rostrum it slightly resembles *Palæmon ensiculus*, Smith, Trans. Connect. Acad. ii. p. 26, pl. i. fig. 2 (1869), but differs in the number of the teeth and in the form and proportion of the joints of the second pair of legs.

Two specimens are in the collection.

PALÆMON GAUDICHAUDII.

Palæmon gaudichaudii, M.-Edwards, Hist. Nat. Crust. ii. p. 400

(1837); Nicolet, in Gay, Historia de Chile, Zool. tom. iii. Crust. p. 218 (1849); Semper, P. Z. S. p. 586 (1868).

Macrobrachium africanum, Spence Bate, P. Z. S. p. 366, pl. xxxi. fig. 3 (1868).

Hab. Peru (Lima) (*Jelski*). Also found in Chili.

Dr. Semper is undoubtedly right in quoting *M. africanum*, S. Bate, as a synonym of this common American species. The rostrum has generally two or three teeth on the lower margin; but in the variety described by Poeppig under the name of *P. cæmentarius* the rostrum is *entire below*. The synonyms of this variety will run as follows:—

Var. CÆMENTARIUS.

Palæmon cæmentarius, Pöppig, Archiv f. Naturg. ii. p. 143 (1836); Nicolet, in Gay, Historia de Chile, Zool. iii. Crust. p. 219 (1849).

Palæmon gaudichaudii, M.-Edw. & Lucas, in D'Orbigny, Voy. Amér. Mérid. Zool. vi. Crust. p. 37, pl. xvii. fig. 2 (1843).

Bithynis longimana, Philippi, Wiegm. Arch. f. Nat. xxvi. p. 161 (1860).

Hab. Chili.

EURYRHYNCHUS, gen. nov.

Body not depressed. Rostrum triangular, broad at base, acute, very short, barely reaching the extremity of the eyes. Anterior margin of the carapace with a small spine between the eyes and the rostrum, and another below the point of insertion of the peduncle of the antennæ. Antennæ with a small basal scale. Antennules with three flagella. Outer maxillipeds slender. Second pair of legs nearly as in *Anchistia*. Tarsi of the last three pairs of legs nearly straight, acute.

This genus is distinguished from others of the family *Palæmonidæ* with three flagella to the antennules by the very short broad rostrum. It is perhaps most nearly allied to the genus *Harpilius*, Dana, but differs in the form of the rostrum, and the basal scale of the antennæ is much shorter.

EURYRHYNCHUS WRZESNIOWSKII, sp. n. (Plate LXVII. fig. 2.)

Slender; second segment of the abdomen considerably dilated on the sides; third to fifth segments with the postero-lateral angles subacute, directed backward; terminal segment longer than broad, with the sides straight, rounded at the end, and, as well as the appendages of the penultimate segment, ciliated at the extremity. Antennules with the first exposed joint of the peduncle as long as the two succeeding. Antennæ with basal scale acute, rather longer than the peduncle; flagellum very slender. Anterior legs very slender; hand not as long as wrist, palm about equalling fingers in length. Second pair of legs about twice as long as carapace; arm about as long as wrist, hand about twice as long as wrist, palm compressed, fingers about as long as palm, straight, and closely meeting along their inner edges. Length about $7\frac{1}{2}$ lines.

Hab. Cayenne.

Of this small species but two specimens, in an imperfect condition, are in the collection; and although I dissected the mouth-organs of one specimen, I failed to extract them in a sufficiently perfect condition to admit of their description. The specimens were found in a well.

ISOPODA.

The species of Isopoda described in the present paper belong to the terrestrial or subaquatic *Armadillidæ* and *Oniscidæ*, and the parasitic *Cymothoidæ*. The species of the two former families have been comparatively neglected by modern carcinologists, and many of the continental species are known only from the short and insufficient descriptions of Brandt, Koch, and other authors, based mainly upon differences of colour, which is often a very variable characteristic in individuals of a single species, and, taken alone, will not always suffice to identify the animals of this group. Probably better characters are to be found in the punctulation and granulation of the body, and the form of the antero-lateral lobes of the head and of the segments of the body, and uropoda.

On account of the brevity of many of the earlier descriptions, it is very difficult, or even impossible, to institute comparisons between the different species; and, as stated above, I have only attempted to do this, in the case of the American species, with others of the same genera inhabiting the American continent.

The mouth-organs, which in the *Amphipoda* afford very valuable characters for the distinction of genera, in the Isopoda (at least in the terrestrial members of the order) do not present any marked peculiarities of structure. M. Lereboullet, one of the best authorities on the subject, has, in the abstract of his valuable memoir on the *Oniscidæ* of the environs of Strasbourg (Comptes Rendus, xx. p. 346, 1849), even stated it as his opinion that they are in no case available for characterizing the genera and species.

Family Armadillidæ.

Subfamily Armadillinæ.

Professor Brandt, in his subdivisons of this family, which are very natural, and were adopted almost without modification by M. Milne-Edwards in the 'Histoire naturelle des Crustacés,' makes two subfamilies—(*a*) *Armadillidia*, containing only his genus *Armadillidium*, and (*b*) *Cubaridea*, including the genera *Cubaris*, *Armadillo*, and *Diploexochus*. Unfortunately he restricts the genus *Armadillo* to the single species *A. officinalis*, Duméril, which had not been described when Latreille founded the genus, and does not mention at all the earlier *A. vulgaris* of Latreille, which, as described by Milne-Edwards, Lereboullet, and other authors, belongs to his genus *Armadillidium*.

I therefore retain the name of *Armadillo* for those species in which the terminal segment of the abdomen is *truncate at the ex-*

tremity, with the posterior margin straight, transverse. The genus, thus restricted, will correspond to the section β of Brandt, and § 2 of Milne-Edwards in the genus *Armadillidium*, and will include the *Armadillo vulgaris*[1] of Latreille. The genus *Armadillidium* will then be restricted to section α of Brandt, and § 1 of Milne-Edwards in the same genus; while the *A. officinalis*, Duméril, and allied species will constitute a distinct genus, which I propose to designate *Orthonus*[2], *characterized by the straight posterior margins of the segments, which are never revolute.*

The following is a tabulated arrangement of the genera to which the species described in the present paper are referred:—

I. Armadillidia.

Armadillidia, Brandt, Bull. Soc. Nat. Mosc. vi. p. 184 (1833).

Apical joint of the uropoda usually large, inserted at the apex of the basal joint.

Armadillidium, Brandt (section *a*), Bull. Soc. Nat. Mosc. vi. p. 185 (1833); Milne-Edwards (§ 1), Hist. Nat. Crust. iii. p. 181 (1840).

Terminal segment triangular, acute at the extremity.

Armadillo, Latr. (part), Hist. Nat. Crust. et Ins. vii. p. 47 (1804).

Terminal segment quadrangular, truncate at the extremity.

II. Cubaridea.

Cubaridea, Brandt, Bull. Soc. Nat. Mosc. vi. p. 189 (1833).

Apical joint of the uropoda very small, inserted in the middle of the inner lateral margin of the produced basal joint.

Cubaris, Brandt, Bull. Soc. Nat. Mosc. Hist. vi. p. 189 (1833).

Armadillo (§ 2), Milne-Edwards, Hist. Nat. Crust. iii. p. 179 (1840).

Posterior margins of the first two or three, or even of all the segments of the body with the posterior margins angulate-excavate on the sides; lateral margins often somewhat revolute. Terminal segment with the posterior margin straight.

Orthonus[3], gen. nov.

Armadillo, Brandt, *l. c.* p. 191 (1833); nec Latr.

Armadillo (§ 1), M.-Edwards, Hist. Nat. Crust. iii. p. 178 (1840).

Posterior margins of all the segments straight. Lateral margins never revolute.

[1] Messrs. S. Bate and Westwood, in the 'British Sessile-eyed Crustacea,' also use the name *Armadillo* for *A. vulgaris*.

[2] ὀρθός, straight; ὄνος, wood-louse.

[3] The *Armadillo inconspicuus*, from New Zealand, described by me (Cat. New-Zeal. Crust. p. 95, pl. ii. fig. 4, 1876) belongs to this genus.

Armadillidium, Brandt.

Armadillidium cælatum, sp. n. (Plate LXVII. fig. 3.)

Convex, very finely and closely punctulated and pubescent. Head transverse-oblong, closely encased in the first segment of the body, with the anterior margin reflexed, more prominent in the centre, and slightly sinuated toward the antero-lateral angles, which are not prominent. Eyes minute, placed close to the antero-lateral angles. First segment of the body somewhat larger on the sides than the rest, with the postero-lateral angles acute, the posterior margin slightly excavate; following segments with the posterior margins nearly straight. Segments of the tail short; third to fifth bent backward on the sides; terminal segment broader than long, triangular. Terminal joints of the uropoda transverse when viewed from above. External antennæ with the last two joints (flagellum) together about as long as, but more slender than, the preceding joint, the penultimate much shorter than the terminal joint. Colour generally dark brown. Length about 4 lines, breadth 2 lines.

Hab. Cayenne.

Armadillo, Latr.

Armadillo vulgaris.

Oniscus armadillo, Linn. Syst. Nat. (ed. xii.) p. 1062 (1766).

Armadillo vulgaris, Latr. Hist. Nat. Crust. et Ins. vii. p. 48 (1804); Leach, Trans. Linn. Soc. xi. p. 376 (1815); Spence Bate and Westwood, Hist. Brit. Sessile-eyed Crust. ii. p. 492 (1868).

Armadillidium vulgare, M.-Edw. Hist. Nat. Crust. iii. p. 184 (1840); Kinahan, Nat.-Hist. Rev. iv. p. 276, pl. xxi. figs. 3, 9–13 (1857).

Hab. Cayenne.

There are in the collection several examples of a species of *Armadillo* purporting to have been collected at Cayenne, in which, after a careful comparison with specimens of the common British *Armadillo vulgaris*, in the British-Museum collection, I am unable to detect any distinctive peculiarity whatever. They agree in size, punctulation of the body, coloration, &c. With these specimens was sent a single example of a Myriopod, which to the inexperienced eye of a collector might, upon mere superficial examination, be easily mistaken for the same species as the *Armadillo*. My friend and colleague in the Zoological Department, Mr. A. G. Butler, informs me that this is certainly the European *Glomeris marginata*, Olivier. It appears very probable that here (as in the case of *Cymothoa œstrum*) the locality of the specimen has been wrongly given. It is difficult to see how, in the case of the *Armadillidia* (terrestrial Isopoda living under stones, in moist earth, &c.), the same species could inhabit Europe and South America.

This species is evidently very closely allied to the *Armadillo pilularis* of Say (Journ. Acad. Nat. Sci. Phil. i. p. 432, 1818), from North America, of which a single specimen, presented by Say, is in the British-Museum collection. In this specimen the terminal

segment is imperfect, and cannot be compared with that of *A. vulgaris*; it is, however, rather more coarsely punctulated, and of a darker colour, variegated with bright yellow markings.

Cubaris, Brandt.

Cubaris affinis, sp. n. (Plate LXVII. fig. 4.)

Oblong-oval, convex, with the segments very finely and closely granulated, with a transverse series of much larger granules on each segment of the body, on each side of the middle line. Head transverse-oblong, anterior margin straight, reflexed, and level with the strongly reflexed lateral margins of the first segment of the body. Eyes small, granulated, and placed close to the lateral margins of the head. First three segments of the body with the segments angularly bent backwards on the sides, the angulation being most conspicuous in the first segment. Segments of the tail short, with the upper surface plane, or even slightly concave on the sides, towards the lateral margin. Terminal segment concave above, and with the lateral margins excavated, very nearly as wide at the straight posterior as at the anterior margin. Antennæ with the two terminal joints (flagellum) short, together not as long as the antepenultimate joint; penultimate about one third the length of terminal joint. Inner (terminal) joint of the uropoda minute, inserted upon the inner margin of the longitudinal oblong penultimate joint. Colour dark-brown in spirit; when dry the specimens are white. Length $\frac{1}{3}$ inch, breadth $\frac{1}{6}$ inch.

Hab. Cayenne.

Specimens from Jamaica belonging to this species are in the British-Museum collection.

C. affinis is very nearly allied to *C. cubensis* (*Armadillo cubensis*, De Saussure, Mém. Soc. Phys. et Hist. Nat. Genève, xiv. (2) pl. 481, pl. v. fig. 42, 1858), which, however, has the terminal segment longer in proportion to its width, and the posterior margin of each segment of the body is marked with a transverse groove, which is reflexed and continued along the latero-inferior margin, and is strongly marked on the anterior segments. *A. cacahuamilpensis*, Bilimek (Verh. zool.-bot. Gesellsch. xvii. p. 907, 1867) from Mexico, which is also, I believe, a *Cubaris*, is distinguished by the great breadth of the first segment of the body, &c.

Another American species of this genus, in the British-Museum collection, may be characterized as follows:—

Cubaris gigas, sp. n. (Plate LXVIII. fig. 1.)

Convex oblong-oval, nearly smooth, surface only very minutely granulated, and with only obscure indications of larger tubercles on each side of the middle line. Head transverse, with the anterior margin straight, reflexed at a right angle (as seen in a lateral view) with the upper surface of the head, and (as seen in a dorsal view) also forming a right angle with the lateral margins; antero-lateral lobes wanting. First segment of the body very concave on the sides, with the lateral margins strongly reflexed; all the segments distinctly

flexed backward on the sides, with the posterior margins angulate-excavate. Terminal segment of the tail about as broad as long, with the sides excavated; upper surface flat, with a shallow depression on each side, and a small median pit near the base. Antennæ with the flagellum much shorter than the last joint of the peduncle, with the first joint the shortest. Basal joint of the uropoda (viewed from above) oblong, terminal (apparent lateral) joint quite minute. Colour light grey. Length 10½ lines.

Hab. Nicaragua, S. Juan (*Sallé*). (Coll. Brit. Mus.)

This species is remarkable for its large size; it is larger than any other species of the genus in the British-Museum collection. In the prominent anterior margin of the head, beneath which the antennæ are partly concealed, it resembles the genus *Pyrgoniscus*, Kinahan, which, I may add, is wrongly referred by Dr. Kinahan to the *Porcellionidæ*, and belongs certainly to the *Armadillidæ*, and is nearly allied to *Cubaris*.

Family Oniscidæ.

Subfamily Oniscinæ.

Porcellio, Latreille.

De Saussure (Mém. Soc. Phys. et Hist. Nat. Genève, xiv. pp. 477, 480), has based the characters of his primary sections of this genus on the form of the segments of the body. These appear to me at once so natural and characteristic, that I adopt them as subgeneric divisions.

Subgenus Porcellio.

Postero-lateral angles of all the segments of the body acute, and produced backward.

Porcellio cayennensis, sp. n. (Plate LXVIII. fig. 2.)

Moderately convex, with the segments somewhat laterally produced, and separated from one another toward the lateral margins, everywhere closely and finely granulated, with larger granules, not extending far toward the lateral margins on each segment. Head small, transverse-oblong, deeply encased in the first segment, strongly granulated, with the antero-lateral lobes very prominent, concave above, and subacute at the extremity. Eyes small. All the segments of the body with the antero-lateral angles rounded; the posterior margins excavated on the sides towards the postero-lateral angle, which is acute and produced backward; seventh segment with the posterior margin regularly excavate. Segments of the tail short, with the lateral portion angularly flexed backward, the laterally flexed portion in the third segment equalling one third the width of the segment; terminal segment somewhat T-shaped, longer than broad, subacute at the extremity, and produced beyond the extremity of the basal joint of the uropoda. Antennæ wanting. Colour light-yellow and brown variegated. Length ½ inch, breadth ¼ inch.

Hab. Cayenne.

In neither of the two specimens in the collection is the terminal

joint of the uropoda *in situ*. One, which is loose in the tube, and almost certainly belongs to this species, is short, barely twice the length of the basal joint.

As the external antennæ are wanting, it must be a matter of uncertainty whether this species is to be referred to this genus or *Oniscus*.

The *Porcellio spinicornis* and *Porcellio nigra* of Say (Journ. Ac Nat. Sci. Phil. i. pp. 431, 432, 1818), from the United States, belong to this subgenus, as specimens in the British-Museum collection presented by Say, prove. In both species the body is more closely articulated, and the terminal segment more triangular and shorter than in *P. cayennensis*.

Subgenus PORCELLIONIDES.

Postero-lateral angles of the first four segments of the body not acute and not produced backward.

a. *Depressed, with the antero-lateral portion of the head small.*

PORCELLIO JELSKII, sp. n. (Plate LXVIII. fig. 3.)

Oblong-oval, depressed, very finely and closely punctulated, and with scattered but faintly indicated granules, tending to a transverse arrangement on each segment. Head small, transverse; antero-lateral lobes very small, nearly obsolete. Eyes small, black. First four segments of the body with the posterior margins straight, and forming nearly a right angle with the lateral margins; remaining segments with the posterior margins becoming successively slightly more excavated and with the postero-lateral angles subacute. Tail short; third to fifth segments with the posterior margins straight to within a short distance of the postero-lateral angle, which is acute, and directed backwards; terminal segment triangular, rather broader than long, with a slight depression above, with the lateral margins a little excavated, subacute at the extremity, and projecting but very slightly beyond the basal joint of the uropoda. Antennæ slender, with the two terminal joints (flagellum) together about as long as the preceding, the terminal a very little shorter than the penultimate joint. Uropoda with the terminal joint two or three times as long as the preceding, narrow-lanceolate, acute at the extremity. Colour light purplish-brown, variegated with irregular narrow pale markings; lateral margins of the segments without broad yellow bands. Length 5 lines, breadth 2 lines.

Hab. Peru; Guiana.

A large series of specimens of this species, which appears to be common, is in the collection.

This species differs from *P. chilensis*, Dana (nec Gay), in the joints of the flagellum of the external antennæ (in that species the first is nearly twice the length of the second joint), the more deeply concave seventh segment of the body, and the longer rami of the uropoda—from *P. cubensis* and *P. sumichrasti*, De Saussure, from Cuba (which it somewhat resembles in the form of the terminal

segment), in the much smaller antero-lateral lobes of the head—from *P. granarus* and *P. liliputanus*, Gay, from Chili, in the nearly equal joints of the flagellum of the external antennæ, &c.

In a single specimen from Peru, the terminal segment is transverse-triangular, nearly of the form of that of *P. poeyi*, De Saussure, from Cuba; but as this exactly agrees with the other specimens of the same series in other particulars, I do not regard this as more than an individual peculiarity.

PORCELLIO FLAVO-VITTATA, sp. n. (Plate LXVIII. fig. 4.)

More oblong in form, and a little more convex than the preceding species, with the granulations upon the body more distinctly marked, the sides of the body straighter. Colour blackish brown, variegated as in the preceding species. Lateral margins of the segments of the body with a marginal yellow band. Length 4 lines, breadth nearly 2 lines.

Hab. Cayenne.

This species is very nearly allied to the preceding; yet the differences above mentioned appear generally constant. In one specimen only, without antennæ and uropoda, and which might, if in better condition, have proved distinct, is the lateral marginal yellow band entirely absent.

All the specimens are unfortunately much mutilated.

b. *Convex, with the antero-lateral lobes of the head prominent.*

PORCELLIO AZTECUS.

Porcellio aztecus, De Saussure, Mém. Soc. Phys. et Hist. Nat. Genève, xiv. (part 2) p. 479, pl. v. fig. 38 (1858).

Porcellio mexicanus, De Saussure, *l. c.* p. 479, pl. v. figs. 39, 40 (1858).

Hab. Peru (Lima).

In the good series of specimens of this species in the collection, I have observed between younger and fully-matured animals just the differences that are instanced by De Saussure as existing between *P. aztecus* and *P. mexicanus*, which I am therefore inclined to consider different ages of one and the same species, well characterized by its large size, convex, finely and uniformly granulated body, the prominent antero-lateral lobes of the head, the form of the terminal segment, uropoda, etc.

Porcellio interruptus, Heller (Reise der Novara, Crust. p. 136, 1865) from Chili, which, on account of the prominent antero-lateral lobes of the head, probably belongs to this section, differs in having the four anterior segments of the body much narrower than the preceding.

PHILOUGRIA, Kinahan[1].

To this genus I refer a species obtained in Peru and Guiana, and always occurring in the collection in the same tubes with *Porcellio*

[1] According to Messrs. Spence Bate and Westwood = *Itea*, Koch, a name employed by Linnæus for a genus of plants. I regret that I have not myself had

jelskii. It agrees well with *Philougria* in the transverse front, in which the median and antero-lateral lobes are obsolete, the subulated flagella of the external antennæ, and the exposed uropoda, which have the inner ramus long, more than half the length of the outer.

PHILOUGRIA NITIDA, sp. n. (Plate LXIX. fig. 3.)

Oblong-oval, shining, very convex; segments closely articulated, with minute scattered granules. Head transverse, with the anterior margin straight, without antero-lateral lobes. Eyes black, granulated, and extending along the whole length of the lateral margins. Segments of the body subequal, lateral margins with a raised marginal line; posterior margins of the first three segments straight, and forming a right angle with the lateral margins; last four segments slightly excavate on the sides, postero-lateral angles acute. Third, fourth, and fifth (exposed) segments of the tail with the lateral part bent backward, almost at a right angle to the median portion of the segment. Terminal segment much broader than long, obtusely triangular, with a well-marked depression between the bases of the uropoda (which, however, is more conspicuous in some specimens than in others). Antennæ shorter than the body, very slender; flagellum three-jointed, and terminating in a long slender transparent filament. Legs very slender, with short hairs on the last three joints. Basal joints of the uropoda very short, terminal joint more than three times as long as the basal joint, acute. Colour purplish-brown; with irregular yellow spots and patches. Length $\frac{1}{3}$ inch, breadth $\frac{1}{8}$ inch.

Hab. Peru, Guiana.

Distinguished by its convex, shining appearance, the form of the head and of the terminal segment, and of the far longer slender terminal filament of the flagella of the external antennæ, from the known species of the genus.

The specimens from Guiana generally appear rather more coarsely granulated.

Subfamily LIGIINÆ.

LIGIA, Fabricius.

LIGIA BAUDINIANA?

? *Ligia baudiniana*, Milne-Edw. Hist. Nat. Crust. iii. p. 155 (1840).

Hab. Cayenne.

As this species is only known to me by the short description of Milne-Edwards in the 'Histoire naturelle des Crustacés,' I subjoin the following description of the specimens from Cayenne.

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an opportunity of consulting Koch's account of the German species of *Oniscidæ*, either in his 'Continuation' of Panzer's 'Deutschlands Insecten,' or in his 'Deutschlands Crustaceen.'

Dr. von Martens (Zool. Record for 1868, p. 522), points out that the name *Philougria* should be spelt *Philygria*. As, however, the term *Philygria* was used in 1843 by Stenhammar for a genus of Dipterous insects, I retain the designation *Philougria*, albeit etymologically incorrect.

Body narrow-oblong, or slightly oblong-oval, with scattered granules, which are disposed in transverse series, only upon the posterior margin of each segment. Head transverse. Eyes large, black, of considerable width, and occupying the whole length of the lateral margin. First three or four segments of the body with the posterior margins straight, the succeeding segments with the posterior margins becoming gradually more concave, and the postero-lateral angles more acute. Segments of the tail with the postero-lateral angles long, narrow, acute, and flexed backwards; terminal segment transverse-oblong, posterior margin tridentate, nearly straight to within a short distance of the postero-lateral angle, then slightly sinuated, postero-lateral angle prominent, triangular, acute. Peduncle of the external antennæ with the terminal very little longer than the penultimate joint, flagellum 32–36-jointed. Rami of the uropoda a little unequal, longer than the peduncle, inner with a small slender terminal appendage. Length nearly 1 inch, breadth 5 lines.

The specimens in the collection have longer antennæ than those described by Milne-Edwards, reaching in one nearly, in another quite, to the extremity of the body. The length of the antennæ cannot, however, always be depended upon as a constant specific character; and the number of joints is sometimes variable. The slender styliform appendage to the inner ramus of the uropoda is found in other species of the genus, as, for example, the typical *L. aquatica*, where it is quite minute. It is absent in many specimens, and is probably very easily disarticulated and lost.

This species resembles the Californian *L. occidentalis*, Dana, U.S. Expl. Exp. xiv. Crust. ii. p. 742, pl. xlix. f. 7 (1853); but the teeth of the terminal segment are more prominent; the antennæ are also much longer.

The *Ligia stimpsoni*[1], from California, is at once distinguished by its very broad flat body.

De Saussure (Mém. Soc. Phys. et Hist. Nat. Genève, p. 476) found specimens in Cuba which, he says, are not to be distinguished from *L. baudiniana*; and specimens collected at Rio Janeiro by Dr. Cunningham are referred by Mr. Spence Bate to this species (Ann. & Mag. Nat. Hist. i. p. 443, 446, 1868). Specimens from Rio de Janeiro are also in the British-Museum collection.

Family Cymothoidæ,

Cymothoa, Fabricius.

Cymothoa œstrum.

? *Oniscus œstrum*, Linn. Syst. Nat. ed. xii. p. 1059 (1766); Fab. Syst. Ent. p. 294 (1775).

Cymothoa œstrum, Fab. Ent. Syst. ii. p. 505 (1793)?; Leach, Trans. Linn. Soc. xi. p. 372 (1815); Desm. Consid. Crust. p. 307,

[1] I propose this name for the *Ligia dilatata* of Stimpson (Proc. Boston Soc. Nat. Hist. vi. p. 88, 1856–59; and Journ. Boston Soc. Nat. Hist. vi. p. 507, pl. xxii. fig. 8, 1857), the name *Ligia dilatata* having been preoccupied by Brandt for a South-African species of the genus (Bull. Mosc. vi. p. 172, 1833).

pl. xlvii. figs. 6, 7 (1825); M.-Edw. Hist. Nat. Crust. iii. p. 269 (1840); Règne Animal de Cuvier (éd. Crochard), Crust. pl. lxv. fig. 1; Spence Bate and Westwood, Hist. Brit. Sessile-eyed Crust. ii. p. 274, footnote (1868).

Hab. Peru.

To this species I refer two specimens in the collection, numbered as coming from Peru (the largest an adult female, length 1 inch 5 lines), which agree in every respect with the specimens in the British-Museum collection, described by Leach as *Cymothoa œstrum*, from European seas. Like these specimens they have the anterior lobes of the first segment of the body broad, subtruncate, and produced to a level with the anterior margin of the head, which appears straight in a dorsal view, but is inflexed, and conceals the bases of the superior antennæ; the joints of the peduncle slender, not dilated; the thigh-joint of the fourth pair of legs produced in the form of an acute tubercle, which is most prominent in the younger animal, the same joint of the following legs greatly dilated posteriorly; the terminal segment transverse, the rami of the uropoda very small, subequal, &c. It is very improbable that the same species should inhabit the seas of Peru and Europe; and I think it safer to conclude, as there are some species in the collection avowedly from the Mediterranean, that the label in this instance, as in the case of *Armadillo vulgaris*, has been misplaced, and that the true habitat of these specimens is European. No particulars are given of the fish on which they were parasitic.

The West-Indian *C. dufresnii*, Leach, is very nearly allied to this species; but the anterior lobes of the first segment of the body are not quite so squarely truncate, and the lobe of the thigh-joint of the fourth pair of legs is somewhat less prominent and acute.

Anilocra, Leach.

Anilocra lævis, sp. n. (Plate LXVIII. fig. 6.)

Body regularly convex, oval; first six segments of the tail of equal width, terminal segment considerably broader. Head small, narrowed anteriorly, front narrowed, rounded, inflexed, and concealing the bases of the inner antennæ. Eyes black, oblong. First segment of the body with the antero-lateral angles not at all prominent, postero-lateral angles rounded and entire; second to sixth segments with the posterior margins nearly straight; seventh segment with the posterior margin regularly excavate, the postero-lateral angle broad, obtuse and rounded. Segments of the tail rounded on the sides, terminal segment with the posterior margin rounded. Epimeræ or coxæ small, of the second, third, and fourth segments obtuse, of the fifth to seventh segments subacute and somewhat spiniform. Superior (inner) antennæ nearly reaching to the anterior margin of the first segment of the body, eight-jointed; first three joints (peduncle) larger than the succeeding. Inferior antennæ 9-jointed, nearly reaching to the posterior margin of the first segment of the body, peduncle five-jointed, the fifth joint the longest. Rami of the

uropoda lamellate, compressed, oval, the inner slightly the larger. Length 1 inch 7 lines, breadth 7½ lines.

Hab. Martinique; Peru.

A specimen from each locality is in the collection.

This species appears to be nearly allied to, but distinct from *A. laticauda*, Milne-Edwards (Hist. Nat. Crust. iii. p. 259, 1840), from the West Indies, and *A. mexicana*, De Saussure (Mém. Soc. Phys. et Hist. Nat. Genève, xiv. part 2, p. 484, 1858), from the Gulf of Mexico. From the latter species it differs in the form of the first segment of the body, which in *A. mexicana* has the latero-anterior margins provided with a small tubercle, and the latero-posterior margins notched (the epimeræ also, in this species are uniform), from *A. laticauda* in the much longer internal antennæ and in the length of the rami of the uropoda, the inner being equal to or shorter than the outer in *A. laticauda*.

Old-world Species.

DECAPODA.

ACANTHONYX, Latr.

The following is a species hitherto only known by the name (without description) applied to it by White in the 'List of Crustacea in the Collection of the British Museum,' p. 11 (1847).

ACANTHONYX ELONGATUS. (Plate LXIX. fig. 1.)

Carapace smooth, without hairs. Gastric and genital regions convex, gastric region with two strong tubercles, lateral margins slightly excavated, with the median tooth obscure and nearly equidistant from the prominent obtuse anterior and the obtusely triangular posterior tooth. Front and rostrum obliquely deflexed, with the supraocular and rostral spines prominent. Anterior legs (in the male) very much enlarged, wrist obscurely ridged, hand compressed, fingers, when closed, meeting only at tips. Ambulatory legs wanting. Abdomen (of male) narrow, six-jointed, the fourth and fifth joints coalescent. Length to end of rostrum, 1 inch 1 line.

Hab. Red Sea.

A single specimen is in the British-Museum collection.

ANOMURA.

CLIBANARIUS, Dana.

CLIBANARIUS MISANTHROPUS.

Pagurus misanthropus, Risso, Crust. des Environs de Nice, p. 56 (1816); Hist. Nat. Eur. mérid. v. p. 41 (1826); Roux, Crust. de la Méditerranée, 3e livr. pl. xiv. fig. 1, 2 (1828); M.-Edw. Hist. Nat. Crust. ii. p. 228 (1837).

Pagurus labillardieri, Audouin, Expl. d. Planches de Savigny, Egypte, Crust. pl. ix. fig. 2, p. 89 (1809).

Hab. —?

A good series of specimens is in the collection.

I am in some doubt whether this species be the *C. misanthropus* of Risso and of M. Milne-Edwards, who apparently copied Risso's description; but it is almost certainly the species figured under this name by Roux. It differs only in having the tarsi striped with red upon a white instead of a blue ground; but this latter colour is in all probability evanescent; indeed in one or two specimens from the Spanish coast in the collection of the British Museum, some very faint traces of the blue coloration are still discernible.

Clibanarius oculatus, Fabricius, as described by M. Milne-Edwards, appears to differ in having the tarsi much shorter than the penultimate joint. They are coloured with longitudinal red and yellow lines.

ISOPODA.

Armadillidæ.

Subfamily Tylosinæ.

Tylos, Latreille.

Tylos latreillei.

Tylos latreillei, Audouin, Expl. d. planches de Savigny, Egypte, Crust. pl. xiii. fig. 1, p. 96 (1809); M.-Edw. Hist. Crust. iii. p. 188 (1840); Règne Animal de Cuvier, Crust. pl. lxx. bis, fig. 2; Heller, Reise der Novara, Crust. p. 137 (1865); Verh. zool.-bot. Gesellsch. Wien, xvi. p. 732 (1866).

Tylos armadillo, Latr. Règne Animal de Cuvier, iv. p. 142 (1829); Guérin-Méneville, Iconogr. Règne Animal, Crust. p. 35. pl. xxxvi. fig. 4.

Hab. Odessa.

The colour of the specimens in the collection is light brown, length 6½ lines, breadth 3 lines. The lateral margins of the coxæ and segments of the tail are fringed with very short hairs. This species appears to be common in the Mediterranean region, having been recorded from Egypt, Algeria, Gibraltar, Lesina, &c.

The specimens I refer to *Tylos latreillei* differ from specimens of *T. capensis*, Krauss, in the British-Museum collection, from Simon's Bay, South Africa, in their much smaller size (the largest specimen of *T. capensis* is one inch in length), and in the form of the epimeral piece or coxa of the sixth pair of legs; in *T. latreillei* the postero-lateral angle of this joint is rounded; in *T. capensis* the posterior margin is straight, and forms a right angle with the posterior margin. Moreover in *T. capensis* the segments are nearly smooth, or only very finely granulated; in *T. latreillei* they are rather strongly punctulated and rugose. In both species the postero-lateral angle of the coxa of the last pair of legs is acute.

Tylos granulatus, sp. n. (Plate LXIX. fig. 2.)

Convex, coarsely granulated, the granules on the dorsal surface of the body separated by linear smooth intervening spaces; the process of the epistoma separating the basal joints of the antennæ, and the peduncles of the antennæ themselves, very strongly granulated. Postero-lateral angles of the first segment of the body strongly flexed backward and acute. Terminal segment of the tail trans-

versely oblong, very much broader than long, and with a slightly reflexed posterior margin. Last four joints of the legs clothed with very stiff short hairs; the epimeral piece or coxa of the last pair of legs with the postero-lateral angle obtuse. Length of largest specimen about $\frac{3}{4}$ inch.

Hab. Kiogo, Japan; and Borneo. (Coll. Brit. Mus.)

This species is distinguished by the granulated body and the obtuse postero-lateral angle of the epimera of the last pair of legs.

Tylos spinulosus, Dana, from Fuegia, differs, as its name imports, in its spinulous body from all the foregoing species.

Subfamily ARMADILLINÆ.

ARMADILLIDIUM, Brandt.

ARMADILLIDIUM PUSTULATUM.

Armadillo pustulatus, Duméril, Dict. Sci. Nat. iii. p. 117 (1816); Desmarest, Consid. gén. des. Crust. p. 325, pl. xlix. fig. 6 (1825).

Armadillidium pustulatum, M.-Edw. Hist. Nat. des Crust. iii. p. 181 (1840).

Armadillidium brunneum, Brandt, Conspect. Monogr. Onisc. p. 185 (1832).

? *Armadillidium zenckeri*, Brandt, *l. c.* p. 185 (1832).

? *Armadillidium pictum*, Brandt, *l. c.* p. 186 (1832).

Hab. Moldavia.

The two specimens in the collection which I refer to this species are convex, oblong-oval, very closely and finely punctulated, and with distinct scattered granules, of which there is a transverse series on the posterior margin of each segment, the granules showing elsewhere a tendency to a similar arrangement. Head transverse-oblong; eyes small, black, granulated; channels for the reception of the bases of the external antennæ deep and well defined. First two segments of the body with the posterior margins angulated on the sides; first segment with the postero-lateral angles subacute. Segments of the tail short, lateral margins straight and forming nearly a right angle with the posterior margins; terminal segment longer than broad, triangular, with the sides straight, subacute at the extremity, flat above. Antennæ with the two terminal joints (flagellum) together not as long as the antepenultimate joint, subequal. Uropoda, when viewed from above, with the basal joint very small, scarcely visible; terminal joint almost completely filling the space between the terminal and penultimate segments. Colour steel-gray, variegated with yellowish white; all the segments with narrow pale margins. Length $10\frac{1}{2}$ lines, breadth about 5 lines.

This species is distinguished by its large size, closely punctulated and distinctly granulated body, and by the form of the terminal segment. Specimens, between which I cannot find differences sufficient to warrant their specific separation, are in the British Museum, from France, Tunis, Tangiers, Malta, and Sardinia.

The species figured by Guérin-Méneville as *A. pustulatum* (Iconogr. R. A. pl. xxxi. fig. 9) is a species of the restricted genus *Armadillo*, perhaps *A. vulgaris*.

Porcellio, Latr.

Porcellio swammerdamii.

Porcellio swammerdamii, Audouin, Explic. des Planches de Savigny, Egypte, Crust. pl. xiii. fig. 6, p. 98 (1809).

Porcellio alexandrinus, Brandt, Conspectus Monogr. Onisc. p. 180 (1832); M.-Edw. Hist. Nat. Crust. iii. p. 172 (1840).

Hab. Egypt.

In the single adult example (length nearly 5 lines) the colour is deep blackish-brown; in this specimen the flagella of the external antennæ are missing. The other specimens are much smaller, and of a much lighter brown colour. They agree well with Savigny's figure of the species, except that the granules are less strongly marked.

Subgenus Porcellionides.

Porcellio hispida, sp. n. (Plate LXVIII. fig. 5.)

Convex, elongate, oval-oblong, everywhere closely covered with minute stiff hairs (which under a low magnifying-power might be mistaken for granules). Head small, transverse, antero-lateral lobes broad, prominent, rounded, and obtuse. Segments of the body all rounded at the junction of the anterior and lateral margins, postero-lateral angles of the first three segments of the body obtuse and rounded, of the remaining segments subacute; posterior margin of the seventh segment concave, and slightly sinuated on the sides. Segments of the tail short and bent backwards on the sides, postero-lateral angles acute; terminal segment triangular, with the sides slightly concave, subacute at the extremity. Antennæ short, the last two joints (flagellum) together shorter than the antepenultimate joint, the terminal joint a little longer than the penultimate joint. Uropoda short; the terminal about twice the length of the penultimate joint, and projecting for about half its length beyond the terminal segment. Colour light brown and light yellow variegated. Length $5\frac{1}{2}$ lines, breadth $2\frac{1}{2}$ lines.

Hab. Mongolia.

This species is remarkable for the minute stiff hairs which clothe the narrow oblong body, the small size of the rami of the uropoda, &c.

Family Cymothoidæ.

Lironeca, Leach.

Lironeca daurica, sp. n. (Plate LXIX. fig. 4.)

Broadly ovate, depressed. Head very small; front prominent, rounded, and concealing the bases of the antennæ, but not inflexed. Eyes small, red. First segment of the body rather the longest, anterior margin concave, with scarcely any trace of antero-lateral lobes. Following segments with the coxæ small, and inserted in front of the antero-lateral angle of the segment, postero-lateral angles of all the segments rounded; last segment very short, and almost semicircularly excavated. Tail small, of equal width throughout, not half the width of the third segment of the body; terminal segment but little broader than long, smooth, with the posterior margin

rounded. Rami of the uropoda subequal, narrow, oblong-oval, and about reaching to the posterior margin of the terminal segment. Antennæ very slender; superior about half as long as the inferior, which just reach to the anterior margin of the first segment of the body. These latter are eight-jointed, the third joint appearing twice as long as the preceding, as if consisting of two coalescent joints, superior antennæ eight-jointed. All the legs with the thigh-joints oblong, and very little dilated posteriorly, the last four pairs with the postero-superior margins slightly produced and carinated. Length about 1 inch, breadth 7½ lines.

Hab. Dauria, R. Onon.

A single specimen (female with ova) is in the collection.

In this species the coxæ are inserted in the angles between the segments of the body, in front of the anterior margin of each segment, not exterior to the lateral margin of the segment, as is usually the case.

It is at once distinguished from the *Cymothoa amurensis*, Gerstaecker, Mém. Acad. Imp. Sci. St.-Pétersbourg, viii. p. 278 (1859) by the slender femora, non-inflexed front, &c.

LIRONECA LATICAUDA, sp. n. (Plate LXIX. fig. 5.)

Ovate, slightly gibbous, moderately convex. Head small, front inflexed, and concealing the bases of the antennæ. First segment of the body with the anterior margin deeply excavate, antero-lateral lobes prominent and obtuse. Coxæ of the following segments oblong and inserted externally to the lateral margin of the segment; in the first, second, and third segments the lateral margin is straight; in the fourth to seventh it is excavated. Terminal segment transverse, with the posterior margin rounded. Rami of the uropoda short, ovate, the outer twice as large as the inner, but not reaching halfway to the posterior margin of the segment. Length nearly 1 inch 3 lines.

Hab. Manchuria. (Coll. Brit. Mus.)

This species cannot be confounded with the foregoing. It is far more closely allied to the *Lironeca novæ-zealandiæ*, described by me (Cat. New-Zeal Crust. p. 106, pl. iii. fig. 2, 1376), which it altogether resembles in external appearance; in that species, however, the epimeræ are longer in proportion to their width, and the rami of the uropoda subequal. In both *L. laticauda* and *L. novæ-zealandiæ* the posterior margin of the thigh-joint of the last four pairs of legs is produced at its proximal extremity and forms a strong tubercle. In *L. emarginata*, Bleeker, Act. Soc. Indo.-Néerl. ii. p. 27, pl. i. fig. 5 (1857), from Batavia, another nearly allied species, the front is produced beyond the bases of the antennæ, and the posterior margin of the thigh-joints of the legs is straight.

ANILOCRA, Leach.

ANILOCRA TRICHIURA. (Plate LXIX. fig. 6.)

Anilocra trichiura, List Crust. Brit. Mus. p. 108 (1847), sine descr.

Narrow-oblong, oval, convex. Head small, with the anterior

margin inflexed, appearing nearly straight in a dorsal view; posterior margin with a small, median, rounded lobe received into a corresponding emargination in the anterior margin of the first segment of the body. First segment of the body longer than the succeeding. Last segment of the tail longer than broad, narrowed to its extremity, which is subacute. Coxæ transverse and obtuse at their posterior extremity. Legs short, with the thigh-joints not dilated. Uropoda very slender; outer ramus very long, more than twice the length of the inner. Length 1 inch.

Hab. Mauritius (*R. Templeton*). (Coll. Brit. Mus.)

This species is at once distinguished by the form of the rami of the uropoda. The habitat, which is given as "Indian Ocean," in the 'List of Crustacea,' *l. c.*, is marked "Mauritius" on the label attached to the specimen.

EXPLANATION OF THE PLATES.

PLATE LXVI.

Fig. 1. *Clibanarius cayennensis*, p. 657, natural size.
2. —— *carnescens*, p. 658, natural size.
3. Carapace, frontal region, eyes and antennæ of *Clibanarius speciosus*, p. 658, magnified about twice the natural size.
3 *a*. Hand of the same, magnified twice natural size.
4. *Clibanarius lordi*, p. 658, natural size.
4 *a*. Carapace, frontal region, eyes and antennæ of the same, magnified twice the natural size.

PLATE LXVII.

Fig. 1. *Palæmon jelskii*, p. 661, lateral view, magnified about twice the natural size.
1 *a*. Carapace, frontal and antennal region of the same, dorsal view, magnified twice the natural size.
1 *b*. Terminal segment and uropoda, magnified.
2. *Eurythynchus wrzesniowskii*, p. 662, lateral view, magnified four times the natural size.
2 *a*. Carapace, frontal and antennal region of the same, magnified four times the natural size.
2 *b*. Terminal segment and uropoda, magnified.
3. *Armadillidium cælatum*, p. 665, dorsal view, magnified twice the natural size.
3 *a*. Dorsal view of head.
3 *b*. Dorsal view of tail-segments of the same, further magnified.
4. *Cubaris affinis*, p. 666, lateral view, magnified twice the natural size.
4 *a*. Dorsal view of head.
4 *b*. Dorsal view of tail-segments of the same, further magnified.

PLATE LXVIII.

Fig. 1. *Cubaris gigas*, p. 666, lateral view, natural size.
1 *a*. Head viewed from above.
1 *b*. Head viewed from below, showing position of the antennæ.
1 *c*. Segments of the tail, dorsal view, all further magnified.
2. *Porcellio cayennensis*, p. 667, dorsal view, magnified twice the natural size.
2 *a*. Front view of head.
2 *b*. Segments of the tail, dorsal view, further magnified.
3. *Porcellio jelskii*, p. 668, dorsal view, magnified twice the natural size.

Fig. 3 *a*. Head and antennæ of the same, dorsal view.
3 *b*. Tail-segments of the same, dorsal view, both further magnified.
4. *Porcellio flavo-vittata*, p. 669, dorsal view, magnified twice the natural size.
4 *a*. Head and antennæ of the same, inferior view.
4 *b*. Segments of the tail, dorsal view, both further magnified.
5. *Porcellio hispida*, p. 676, dorsal view, magnified twice the natural size.
5 *a*. Tail-segments of the same, further magnified.
6. *Anilocra lævis*, p. 672, natural size.
6 *a*. Front and antennæ, magnified.
6 *b*. One of the legs of the last pair.
6 *c*. Uropoda, further magnified.

PLATE LXIX.

Fig. 1. *Acanthonyx elongatus*, p. 673, natural size.
2. *Tylos granulatus*, p. 674, lateral view, natural size.
2 *a*. Head and antennæ, dorsal view.
2 *b*. Segments of the tail, dorsal view, both further magnified.
3. *Philougria nitida*, p. 670, dorsal view, magnified twice the natural size.
3 *a*. Head and antennæ, dorsal view.
3 *b*. Tail-segments, dorsal view, both further magnified.
4. *Lironeca daurica*, p. 676, dorsal view, natural size.
4 *a*. Head and antennæ, dorsal view.
4 *b*. One of the legs of the first pair.
4 *c*. Uropod: all further magnified.
5. *Lironeca laticauda*, p. 677, dorsal view, natural size.
5 *a*. Head and antennæ, inferior view.
5 *b*. One of the legs of the first pair.
5 *c*. Uropod: all further magnified.
6. *Anilocra trichiura*, p. 677, dorsal view, natural size.
6 *a*. One of the legs of the first pair, magnified.

November 6th, 1877.

Arthur Grote, Esq., V.P., in the Chair.

The Secretary read the following reports on the additions to the Society's Menagerie during the months of June, July, August, and September 1877:—

The total number of registered additions to the Society's Menagerie during the month of June was 166, of which 87 were by birth, 35 by presentation, 25 by purchase, 1 by exchange, and 18 were received on deposit. The total number of departures during the same period by death and removals was 92.

The most noticeable additions during the month of June were as follows:—

1. A White-cheeked Gibbon (*Hylobates leucogenys*), presented by W. H. Newman, Esq., H.B.M. Consul, Siam, Bangkok, June 2nd, and kindly brought to this country under the care of Mr. A. R. Houghton in the steamship 'Agamemnon.' The White-cheeked Gibbon was described many years ago in the Society's 'Proceedings' (P. Z. S. 1840, p. 20) by the late Mr. Ogilby, upon an animal which had been living in the Society's Menagerie, and of which the exact habitat was unknown. The typical specimen is now in the British

Museum. So far as I know, no second individual of this well-marked species of *Hylobates* has since occurred; it is therefore of the greatest interest to have obtained a specimen from a distinct locality[1]. Our present individual, which is a young male, seems to agree in every respect with Mr. Martin's description and figure (Nat. Hist. of Man and Monk. p. 445).

Mr. Smit's figure (Plate LXX.) will, I trust, serve to make this interesting species better known.

2. A Tibetan Partridge (*Perdix hodgsoniæ*, Gould)[2], presented by Monsieur J. M. Cornély, of Tours, C.M.Z.S., on the 16th June, being, so far as I am aware, the first example of this fine representative of this well-known species that has been received by the Society. A second specimen of the same bird has since been purchased from Mr. W. Jamrach, from whom, I believe, M. Cornély obtained his specimen.

3. A young male Hippopotamus, received June 20th, having been purchased of the Royal Zoological Society of Amsterdam for the sum of £800.

The original pair of Hippopotamuses, obtained from the Viceroy of Egypt (the male in 1851, and the female in 1854), being both now well advanced in years and having ceased to breed, the Council thought that it would not be right to miss an opportunity of obtaining a mate for the Society's young female of this species, born in the Gardens on the 5th November, 1872.

The Council accordingly entered into an agreement with the sister Society at Amsterdam for the acquisition of the young male Hippopotamus, which was born in their gardens on the 3rd of August, 1876, and which arrived safely in this country under the care of Mr. Hegt, the subdirector of their Gardens, on the 20th June last. The young animal, which now measures about 2 feet 6 inches in height, has hitherto been fed nearly exclusively on Goat's milk, but is now beginning to take more substantial diet, and appears to be in every way thriving.

4. A fine example of the black variety of the common Leopard (*Felis pardus*), from Lahore, Malay peninsula, presented by Sir Harry St. George Ord, C.B., F.Z.S.

5. Twenty Common Boas (*Boa constrictor*), produced alive by one of the Boas in the Society's Gardens on the 30th June. This is the first occasion in which this Serpent has bred in the Society's Gardens; and, so far as I am aware, the fact of the Boa producing living ones was not certainly known. The young Boas are about 15 inches in length, and are lively and active, threatening to bite if touched. They are already beginning to feed; and we have good hopes that some of them, at least, may be reared[3].

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[1] The notice given by Mr. Blyth (P. Z. S. 1841, p. 63) of the supposed occurrence of this species on the Ghauts of Malabar is, no doubt, founded on some error.

[2] See Gould's 'Birds of Asia,' pt. ix. May 1, 1857, for a figure of this species.

[3] P.S. (November 6th).—All of these Boas, except one, are still alive and in good condition.



J.Smit lith.

Hanhart imp

HYLOBATES LEUCOGENYS



J. Smit lith. Hanhart imp.

PARADOXURUS PREHENSILIS.

The total number of registered additions to the Society's Menagerie during the month of July was 145; of these, 54 were acquired by presentation, 48 by purchase, 5 by exchange, 22 by birth, and 16 were received on deposit. The total number of departures during the same period, by death and removal, was 102.

The most noticeable additions during the month were :—

1. A Prehensile Paradoxure (*Paradoxurus prehensilis*)[1], from Assoun, on the Hounderaw river, about 90 miles from Moulmein, Burmah, presented July 13th, by W. H. Pattison, Esq.

This Paradoxure (Plate LXXI.) is of a well-marked and peculiar species, quite new to us, and appears to be little known except from the figure in Hardwicke and Gray's 'Indian Zoology' (ii. pl. 9), taken from a drawing of Buchanan-Hamilton. Its tail is very long and slender, and appears to be slightly prehensile.

2. A Urumutum Curassow (*Nothocrax urumutum*), from the Upper Amazons, purchased July 16th. When I communicated to the Society my memoir on the Curassows in 1873 (see Trans. Zool. Soc. ix. p. 273) I was unable to figure this rare species from a living example. As will be seen by the coloured sketch now exhibited, the bare skin over the eye was, in consequence, coloured wrongly, the upper portion over the eye being bright yellow instead of blue.

3. A Crane, obtained from Chantung, in Northern China, and kindly transmitted to the Society by Mr. Theodore Hance, of Chingkiang. It appears to belong to the eastern form of the Common Crane, called *Grus longirostris* in the 'Fauna Japonica.'

Comparing this bird (of which I exhibit a sketch by Mr. Smit) with the Common Crane of Europe, *Grus cinerea*, it seems to differ in its lighter colour, and in the uropygial plumes being cinereous with black terminations, instead of being altogether black as in the common species; but I doubt its being specifically different.

The total number of registered additions to the Society's Menagerie during the month of August were 116 in number; of these, 67 were acquired by presentation, 19 by purchase, 4 by birth, 8 by exchange, and 18 received on deposit. The total number of departures during the same period by death and removals were 110.

The most noticeable additions during the month were: —

1. A Cape Hedgehog (*Erinaceus frontalis*), purchased August 13th, being the first example of this southern representative of our familiar British species that has reached us.

2. A young example of the American Tantalus (*Tantalus loculator*), purchased August 30th.

3. A Brazilian Motmot (*Momotus brasiliensis*), purchased on the same day. Both these birds belong to species hitherto unrepresented in the Society's Aviaries.

I may take this opportunity of pointing out that, as suggested to me by Prof. Garrod, the male Deer, which we have had for some

[1] *Viverra prehensilis*, Desm. See Horsf. Cat. Mamm. E.I. C. p. 63.

years in the Gardens under the name of *Cervus duvaucelli*[1], appears to belong to the allied species *Cervus schomburgki* of Siam.

The animal in question was received in exchange from the Zoological Gardens of Hamburg on the 1st of November, 1873. On in-



Head of *Cervus schomburgki*.

quiry, Dr. Bolau, the Secretary of the Zoological Society of Hamburg, has kindly informed me that it was born in the Gardens on July 15th of the same year, having been bred between a male, said to have come from Bangkok in 1862, and a female received from Berlin, which is also believed to have come from Siam.

The total number of registered additions to the Society's Menagerie during the month of September was 81; of these, 31 were acquired by presentation, 25 by purchase, 7 by birth, and 18 were received on deposit. The total number of departures during the same period by death and removals was 101.

[1] See 'List of Vert.' (sixth edition) p. 134. sp. 484*f*.

The most noticeable additions during the month were as follows:—

1. Two Guilding's Amazons (*Chrysotis guildingi*), from St. Vincent's, West Indies, purchased September 15th. These fine Parrots are now said to be very scarce in their native Island of St. Vincent, to which they are peculiar.

2. Two Slaty Coots (*Fulica ardesiaca*) from Western Peru, purchased September 18th, being the first examples of this interesting representative of our Common Coot that have reached us.

The Secretary read the following extract from a letter addressed to him by Mr. R. Trimen, C.M.Z.S., dated South-African Museum, Cape Town, July 27th, 1877:—

"With reference to your note on the species of *Sarcidiornis* (P. Z. S. 1876, pp. 694, 695), I think it may be useful to offer a few remarks on two specimens of the African form contained in the collection of this Museum, one of which was received from the Zambesi, and the other obtained in exchange from the late Mr. C. J. Andersson, who brought it from Damara Land.

"I have no Indian specimens with which to compare these African birds; but, taking Mr. Smit's figure (P. Z. S. 1876, pl. lxvii.) as an accurate representation of *S. melanonota*, the two birds to which I refer differ in the following particulars from the Indian form, viz.:—

"(1) The white of the neck encroaches considerably on the back between the shoulders.

"(2) The curved black streak from the shoulder downward is much more attenuated.

"(3) The under tail-coverts are pure white, without the slightest trace of the bright yellow shown in the figure. (Is it possible that the yellow may have been present in the living specimens, but have faded out in course of time, like that of *Chalcites smaragdineus*?)

"(4) The secondaries and greater coverts are not of the coppery-brown hue depicted in the plate, but mixed metallic-green and bronze with violet reflexions.

"(5) The caruncle on the bill is higher in proportion to its base; it is more vertically elevated anteriorly, and more rounded and sloping posteriorly than is shown in the figure. (This difference may, however, be the effect of shrinking or some defect in mounting our specimens.)

"I should also mention that the lower part of the back is dirty whitish-grey, shading into the metallic-glossed black of the rump.

"You will be better able than myself to judge whether the differences mentioned are of specific value; my own impression is that they are."

A letter was read from Mr. A. O. Hume, C.B., containing some criticisms on Mr. Howard Saunders's review of the Sterninæ, published in the Society's 'Proceedings' for 1876 (p. 638). Mr. Hume was of opinion that the bird figured (plate lxi. fig. 2) as *Anous melanogenys*, was not that species, but *A. leucocapillus*.

The Secretary exhibited, on the part of Mr. G. Dawson Rowley, F.Z.S., an egg of *Pauxis galeata*, and read the following note by Mr. Rowley on the subject:—

"This egg of *Pauxis galeata* was laid June 30, 1877, by a *black* female, exactly like the male, except that in size she is a trifle smaller. The two birds have been kept by themselves for several years in a large aviary. The brown form of female[1] is also here in a different cage; and no communication has been allowed. The black female lays eggs every year; but they have been previously always broken. All the birds have been in my possession about eight or nine years.

Prof. Flower, F.R.S., V.P., read "A further Contribution to our Knowledge of the existing Ziphioid Whales, of the Genus *Mesoplodon*."

This communication contained a description of two skeletons and several skulls of Cetaceans of the genus *Mesoplodon* from New Zealand, sent to England by Dr. Hector and Dr. J. v. Haast, preceded by a review of the species of the genus at present ascertained to exist. These appeared to be the following:—

1. *M. bidens* (Sowerby) = *M. sowerbiensis* of Blainville and most other authors.
Hab. European Seas.

2. *M. europæus*, Gervais.
Hab. North coast of France.
One example only known.

3. *M. densirostris* (Blainville) = *M. seychellensis* (Gray).
Hab. Indian Ocean, Australia.

4. *M. layardi* (Gray) = *M. longirostris*, Krefft = *M. floweri*, Haast = *Callidon guentheri*, Gray = *Dolichodon traversii*, Gray.
Hab. Indian Ocean, Australia, New Zealand.

5. *M. hectori* (Gray) = *M. knoxi*, Hector.
Hab. New Zealand.
Known only by a single individual, of which the skull, now in the British Museum, is described in the present communication.

6. *M. grayi*, Haast = *Oulodon grayi*, Haast.
Hab. New Zealand.
A complete skeleton, in the Museum of the Royal College of Surgeons, is described in the present memoir.

7. *M. haasti*, n. sp., = *M. hectori* (Gray), Hector, Trans. N.Z. Inst. vol. vi. p. 86, and vol. vii. p. 362.
Hab. New Zealand.
A complete skeleton, now in the British Museum, described in the present memoir.

This memoir will be published entire in the Society's 'Transactions.'

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[1] *Cf.* Sclater, Trans. Zool. Soc. vol. ix. p. 285, pl. liii. et P. Z. S. 1870, p. 669.

The following papers were read:—

1. Descriptions of new Reptiles from the Madras Presidency. By Lieut.-Colonel R. H. Beddome, C.M.Z.S.

[Received June 25, 1877.]

Oligodon travancoricum, n. sp.

Belly with quadrangular black spots. Scales in seventeen rows; labials seven (the sixth does not enter the labial margin), one loreal, one anteocular, two postoculars; temporals 1+2. Head with symmetrical black markings; a black band over the postfrontals and vertical, descending through the eye; and another black band descends to corner of mouth. Body brown, with about twenty-nine nearly regular cross bars of black edged with white, each being the breadth of two scales.

Hab. South-Travancore mountains, 3000 feet elevation.

A single specimen only was found; the position of the sixth labial away from the labial margin is probably not constant. Dr. Günther states that it occurs in *Simotes venustus*; but in two specimens of that Snake now in my collection it is excluded in one but not in the other.

Gymnodactylus jeyporensis, n. sp.

Of stout form. Body covered with large hexagonal or nearly square scales in only about eighteen rows across, a few about the vertical line being a little reduced in size; scales of the belly smaller and rounded behind, in about thirty series across. Head covered with small, bead-like, rounded scales; upper labials ten, the last two very small; lower labials seven, the last minute; median lower labial large, pointed behind, with a large pair of chin-shields behind it; subcaudals larger than the scales of the belly. Tail with two tubercles on each side close to the vent; pupil elliptic; opening of the ear subhorizontal. Colour of a light grey, irregularly blotched with dark brown; head with small blotches; nape with two large lunate blotches, one behind the other; body with three 8-shaped blotches, which, however, do not meet, and smaller intermediate markings; tail irregularly blotched.

Length 3½ inches; no femoral nor præanal pores.

Hab. Jeypore hills.

A single example was captured in a wood on the top of the Patinghe hill, 4200 feet elevation. In coloration somewhat like *G. collegalensis* (mihi); but that species has fine granular scales, in about fifty series across the back. This is a larger and stouter species, with more the facies of a *Eublepharis*, but without eyelids.

Bufo travancoricus, n. sp.

Crown flat, without any bony enlargement; snout triangular, projecting; canthus rostralis not very distinct; first, second, and third

fingers of about equal length; third nearly double as long; carpus with a very large smooth tubercle; toes webbed; metatarsus with two small tubercles; no fold on the tarsus; tympanum very small; parotoid elongate, rather indistinct, four times as long as broad. Body and belly covered with warty tubercles; the arms and legs quite spiny. Colour blackish brown; the thighs, arms, and legs beautifully marbled with carmine; the tubercles of the body often tipped with the same colour; those of the belly often whitish.

Length of body $1\frac{3}{4}$ inches, hind legs 2 inches.

Hab. Travancore.

A single specimen was captured, under an old rotten log, in dense moist forests, above the Ayen-Coil pass (Travancore), at about 2500 feet elevation; its nearest ally is the *B. kelaartii*, a Ceylonese species.

In the same forest was captured a fine large species of *Dendrophis*, with almost exactly the coloration of *Ptyas mucosa*, and no trace of a yellowish lateral band; the scales in fifteen rows, the vertical row very much enlarged and hexagonal, and the two next rows rather enlarged; but as the plates of the head are in every way quite similar to those of *Dendrophis pictus*, and it does not seem to differ from that species in any thing but coloration; I do not like to consider it a new species; it is, however, a new variety, I think.

2. Contributions to the Ornithology of the Philippines.—No. I. On the Collection made by Mr. A. H. Everett in the Island of Luzon. By Arthur, Marquis of Tweeddale, F.R.S., President of the Society.

[Received July 16, 1877.]

(Plates LXXII. and LXXIII.)

Mr. Everett, so favourably known as an able, energetic and zealous field-naturalist, and as one of the foremost explorers of the fauna of Borneo, arrived in the Island of Luzon in the beginning of this year, and, after overcoming the official difficulties which sometimes obstruct scientific investigations in the Philippine Islands, commenced collecting zoological specimens at Monte Alban and San Mateo, stations not far from Manilla. Among other objects Mr. Everett secured some 361 specimens of birds in part of the month of January, in February, and in the beginning of March, 1877. These he has kindly consigned to me; and I propose to give an account of them, adding in each instance the original notes on the labels made by Mr. Everett. Eighty-five species are represented in the collection; and although the neighbourhood of Manilla might with justice be considered as having been exhausted by former collectors, Mr. Everett has discovered three undescribed species, besides adding many more to the already known Luzon, and a few to the Philippine avifauna.

In my memoir on the Birds inhabiting the Philippine Archi-

P.Z.S.1877.Pl.LXXII.



Hanhart imp.

MEGALURUS RUFICEPS.

BERLINER
14 MY 78
MUSEUM



J.Smit lith.

Hanhart imp.

1. DICÆUM XANTHOPYGIUM.
2. OXYCERCA EVERETTI.

pelago[1] I enumerated 218 species. This number must be diminished by one, *Circus æruginosus*, Mr. H. Cuming's Philippine specimen, catalogued under that title by Mr. Sharpe (Cat. Accipitres B. Mus. p. 71), my only authority, being now considered by Mr. Sharpe to be *C. spilonotus*, jr. (see Ibis, 1876, p. 31). Further, I have reason to doubt the Philippine habitat of so-called *Crateropus caudatus* (no. 97). To the net total of 216 species Mr. Sharpe has been able to add some 66 species, for the most part obtained by Dr. Steere[2]. This total is partly arrived at by including 23 species from the island of Palawan, 4 from that of Balabac, and 4 from the Sooloo Islands. In a footnote (*t. c.* p. 126) I excluded the Sooloo archipelago from the Philippine area; and as we have only the evidence of four known Sooloo species of birds to guide us, I am disinclined as yet to concur in Mr. Sharpe's opinion that these islands ought to be included. Nor am I quite certain that Palawan and still more Balabac should not be excluded. That Palawan certainly is a border region, intervening between Borneo and the Philippine Islands, is made evident by Dr. Steere's remarkable discoveries; but the Malayan character of its ornis overpowers the Philippine element; and until its fauna and that of the Sooloo Islands shall have been more completely investigated, I purpose to exclude them from what I consider to be the strictly Philippine area. Deducting, therefore, the 23 Palawan, the 4 Balabac, and the 4 Sooloo species (not known in the Philippine archipelago as restricted by me) from Mr. Sharpe's list (*t. c.* p. 350), in all we have a total of 35 purely Philippine birds added by Dr. Steere to my amended number of 216, making 251 in all. The naturalists of the 'Challenger' Expedition added 11 more (see my paper above, p. 537), making an amended total of 262 Philippine species; and to this number Mr. Everett has enabled me to add 6 from Luzon, namely three new species,

Megalurus ruficeps, *Oxycerca everetti*,
Dicæum xanthopygium,

two not hitherto recorded,

Motacilla ocularis, *Anthus maculatus*,

and one previously supposed to be a Malayan species,

Turnix fasciatus.

So 268 species of birds may at this date be considered the total number known to occur in the Philippine Islands, exclusive of Palawan, Balabac, and the Sooloos.

[1] Trans. Zool. Soc. 1875, ix. pp. 125–252.

[2] Sharpe, Trans. Linn. Soc. ser. 2, Zool. i. p. 307. This number is less by two than Mr. Sharpe's estimate (*t. c.* p. 308), in consequence of my not being able to recognize *Chrysocalaptes maculiceps*, Sharpe, as being distinct from *C. lucidus* (Scop.), and *Hirundo rustica* of the Islands as differing from *H. gutturalis*. *Brachyurus propinquus*, Sharpe, ex Mindanao, does not appear to be distinct from *Erythropitta erythrogastra*, ex Luzon, though the Balabac type may be different. Perhaps the Zebu *Cyornis*, *C. banyumas* of my list (no. 84), may have to be added as constituting a distinct species; for it appears to differ specifically from *C. philippensis*, Sharpe, ex Luzon and Panay.

In the Table showing the geographical distribution of the Philippine birds (*t. c.* pp. 249, 252) I enumerated 57 the exact habitat of which had not been established. From this, one species (the so-called *Crateropus caudatus*) must be deducted. Mr. Sharpe has been able most satisfactorily to reduce the number by 8 (*t. c.* p. 308); and Mr. Everett's discoveries enable me to still further diminish the number by 9.

Philippine species of which the exact habitat has been determined by Mr. Everett:—

Caprimulgus griseatus.
Calliope camtschatkensis.
Phylloscopus borealis (olim *magnirostris*).
Orthotomus derbianus.
Parus elegans.
Geopelia striata.
Turnix ocellata.
Hypotœnidia philippensis.
Ardetta cinnamomea.

So the precise habitats of only 39 species now remain undetermined.

The total number of species known to be resident in the island of Luzon I estimated (*t. c.*) at 133[1]; but Mr. Sharpe has correctly pointed out that Cataguan, which I had treated as a separate island, forms, in reality, part of the island of Luzon. *Puffinus leucomelas*, which I recorded from there, must be added to the number of Luzon birds; and to this Mr. Sharpe adds *Zeocephus rufus* and *Penelopides panini*[2], obtained by Mr. Cuming at Cataguan, and *Erythropitta erythrogastra*, on the faith of a Manilla example so labelled in Mr. Gould's collection. To this amended total of 137 Luzon species Mr. Everett has enabled me to add the 9 species already removed above from the general Philippine list, the 3 undescribed species and the 3 other species new to the fauna above mentioned, besides the following 8 residents of other Philippine islands:—

Eudynamis mindanensis.
Lanius nasutus.
Lalage dominica.
Hirundo gutturalis.
Copsychus mindanensis.
Corydalla lugubris.
Arachnechthra jugularis.
Rhynchœa capensis.

The exact total of known Luzon residents will therefore now amount to 160.

1. Prioniturus discurus (2)[3].

[Monte Alban. *a*, ♂: iris brown; bill lead-grey; feet bluish grey; nails dark grey. *b*, ♂: iris chocolate-brown; bill lead-grey; feet bluish grey; claws dark grey.]

A series of seven examples, ♂ and shot in February, is sent by Mr. Everett, all being in bright green plumage without a trace of blue on the head. The elongated naked shafts of the middle pair of rectrices greatly vary in length, some being only half an inch, others two inches in length. In two examples these feathers are prolonged for about half an inch, but the shafts are webbed.

[1] Conf. Sharpe, *t. c.* p. 309.
[2] Is it not *P. manillæ*?
[3] The numbers following the titles are the same as those of my memoir (*t. c.*).

2. Cyclopsitta lunulata (4).

[San Mateo. ♂ : iris dark brown; bill black, base pale lead-grey; feet greenish grey; nails dark grey.]

The male example is in full dress and in *P.-loxia* plumage. The female has a few verditer-blue chin-, chest-, and throat-plumes, and some of the rump-feathers obscurely lunated—seemingly an immature specimen.

3. Microhierax erythrogenys.

Hierax erythrogenys (10).

[Monte Alban. ♀: iris brown; bill black; feet dull bluish; claws black.]

Obtained in February. In black and white dress; and as Mr. Everett has ascertained the sex to be female, it would seem that the *erythrogenys* plumage is significant of nonage and not of sex.

4. Spilornis holospilus (16).

[Monte Alban. *a*, ♂ : iris golden-yellow; bill dark grey; orbital skin and lores bright yellow-green; cere ditto; claws black; legs yellow.

San Mateo. *b*, ♀: iris golden-yellow; bill dark plumbeous; orbital skin and lores bright greenish-yellow; cere ditto, but greener; legs light chrome-yellow; claws black.]

5. Haliastur intermedius (17).

[San Mateo. ♂ *juv.*: iris warm brown; bill greenish-lead, cere darker; feet greenish yellow, almost white.]

6. Butastur indicus (20).

[San Mateo. *a*, ♂ : iris golden yellow; bill chrome-yellow at the base, rest black; cere chrome; legs dull chrome-yellow; claws black. *b*, ♂ : iris bright yellow; cere chrome-yellow; bill black; legs dull chrome; claws black.]

7. Thriponax javensis (28).

[Monte Alban. ♂ : bill black; feet and claws lead-grey.]

8. Chrysocolaptes hæmatribon (30).

[San Mateo. *a*, ♂ : iris Indian red; bill greenish black; feet pale dull greenish; claws very dark grey.

Monte Alban. *b*, ♂ : iris deep crimson; bill greenish black; feet greenish grey.]

9. Yungipicus maculatus (33).

[Monte Alban. *a*, ♂ : iris brown; bill black; legs greenish. *b*, ♀: iris light brown; bill lead-grey; legs greenish lead-grey.]

Sonnerat's type was obtained in Panay; but these Luzon individuals agree well with his description. He mentions that his example "n'a point de rouge," but that perhaps he had only seen a female. The male sent by Mr. Everett possesses a crimson tuft springing from behind the eye. The species is nearly allied to *Y. fusco-*

albidus, Salvad., ex Java, Sumatra, and Malacca, but is larger, has a more powerful bill, has the white markings on the tertiaries transversely linear rather than rounded, and has the white gular feathers terminated by brown spots.

10. MEROPS PHILIPPINUS (35).

[San Mateo. *a*, ♂ ; iris blood-red; bill black; feet purple-brown. *b*, ♂ : iris crimson ; bill black ; feet light greenish. *c*, ♀ : iris blood-red ; bill black ; legs purple-brown ; claws black. *d*, ♀ : iris blood-red ; bill black ; feet sooty brown ; claws black.

Monte Alban. *e*, ♀ : iris crimson ; bill black ; nails ditto ; legs greenish.]

A series of seven examples, all obtained in the month of February.

11. MEROPS BICOLOR (36).

[Monte Alban. ♂ : bill black ; legs purplish-brown.]

12. EURYSTOMUS ORIENTALIS (37).

[San Mateo. ♂ : iris brown; bill orange-red; feet coral-red ; claws black.]

13. ALCEDO BENGALENSIS (38).

[Monte Alban. *a*, ♂ : iris brown; feet scarlet; claws sienna-brown ; bill black.]

Identical with Bengal examples.

14. ENTOMOBIA GULARIS (44).

[San Mateo. *a*, ♂ : iris dark brown; bill and legs coral-red ; claws sepia-brown. *b*, ♂ : iris dark brown ; bill and legs coral-red ; claws dark brown. *c* : a frog in the gizzard. *d*, ♂ : iris chocolate ; bill and feet coral-red.

Monte Alban. *e*, ♂ : iris dark brown ; bill bright red ; feet coral-red : nails very dark brown. *f*, ♂ : iris dark brown; bill bright red ; feet coral-red.]

The plumage of the two sexes does not differ.

15. SAUROPATIS CHLORIS (47).

[Monte Alban. ♀ : iris and feet dark brown ; bill black, lower half whitish.]

16. ACTENOIDES LINDSAYI (49).

[Monte Alban. *a*, ♂ : iris brown ; bill black, the mandible and culmen yellow ; legs light green. *b*, ♀ : iris brown ; upper half of beak black, culmen and lower half chrome-yellow ; feet light green, claws horn-yellow.]

17. XANTHOLÆMA HÆMACEPHALA (50).

[Monte Alban. ♂ : iris dark hazel-brown ; orbital skin crimson ; bill black ; legs and feet coral-red ; nails greyish black.]

18. CAPRIMULGUS GRISEATUS (56).

[San Mateo. *a*, ♂ : iris dark brown ; tip of bill ditto ; legs light

purple-brown; nails black. *b*, ♂: iris dark chocolate; feet purple-grey.]

Seen from above, this Nightjar is difficult to distinguish from five examples of *C. affinis*, ex Lombock. Underneath it conspicuously differs in having the ventral plumage and the thigh-coverts transversely banded with narrow brown lines, instead of being uniform pale rufo-fulvous. The two outer pairs of rectrices in *C. affinis* are throughout pure white; in these examples of *C. griseatus* the inner webs of the basal third are pale ferruginous banded with brown.

♂. Wing 6·37 inches, tail 4·0, middle toe 0·75.

19. Cacomantis merulinus (57).

[San Mateo. *a*, ♂: iris yellow?; beak very dark brown; feet dirty ochreous; claws black. *b*, ♂: iris pale reddish; legs light chrome-yellow; claws black. *c*, ♂: iris pale reddish; bill black; legs ochreous yellow; nails black; interior of gape red.]

20. Eudynamis mindanensis (61).

[Monte Alban. ♂: iris crimson; bill greyish-green; legs dark lead-grey; nails black.]

21. Dasylophus superciliosus (62).

[Monte Alban. *a*, ♂: iris pure chrome-yellow; orbital skin and base of beak fiery orange; bill pale green; legs greenish chrome; claws dark grey. *b*, ♀: iris chrome-yellow; orbital skin orange; bill pale green, deep orange at base; legs yellow, tinged green on tarsus; nails grey.]

Sexes alike.

22. Lepidogrammus cumingi (63).

[Monte Alban. *a*, ♂: iris crimson; orbital patch ditto; bill horn-yellow; legs grey. *b*, ♂: iris and orbital skin crimson; bill horn-yellow: legs and feet light grey. *c*, ♂: iris and orbital skin crimson; bill horn-yellow; legs dark lead-grey. *d*, ♀: iris and orbital skin crimson; bill horn-yellow; legs and feet grey.]

Sexes alike.

23. Centrococcyx viridis (64).

[Monte Alban. *a*, ♂: iris crimson; bill black; legs dark lead-grey. *b*, ♂ *juv.*: iris crimson; bill and claws black; legs darkest shade of lead-grey.

San Mateo. *c*, ♀: iris bright crimson; bill black; legs lead-grey; claws grey-brown. *d*, ♀ *juv.*: iris brown; legs dark-grey; beak lead-colour.]

Mr. Everett sends a series of seven individuals, four in adult and three in immature plumage. The dimensions of the male and female are alike; and this is the case in a larger series obtained by Dr. B. Meyer (*l. c.*). Count Salvadori (Ucc. Borneo, p. 70) has united the larger *C. affinis* (Horsf.) with the smaller *C. javanensis* (Dumont), on the ground that they respectively represent the two sexes of the

same species. If this is correct, *C. affinis* is an exception to the rule of equality in size which prevails among all the other known Asiatic species of this genus. Moreover Bernstein has shown that the two Javan birds differ in their anatomical structure (*conf.* Walden, Trans. Zool. Soc. viii. pp. 56, 60).

24. Buceros hydrocorax (66).

[Monte Alban. ♂: iris red; bill red; nails dull black; orbital skin yellow; feet brownish red.]

The whole of the back and shoulders of the two examples obtained by Mr. Everett are smeared with an olive-yellow powder, seemingly taken from the oil-glands at the root of the tail. Mr. Elliot (Monogr. Bucerotidæ, pt. ii.) countenances the erroneous statement of the older authors that this Hornbill also inhabits the Moluccas.

25. Penelopides manillæ (69).

[Monte Alban. ♂. iris crimson; orbital skin and base of mandible white; bill dark brown; the casque transparent horn-brown; the oblique bars on the maxilla ochre-yellow; feet and nails dull black; fruit in the gizzard.]

Mr. Sharpe (*t. c.* p. 309) identifies a Cataguan example of this genus in the British Museum with *P. panini*. If the identification and locality are correct, both species inhabit the island of Luzon.

26. Lanius nasutus (70).

[San Mateo. *a*, ♂: iris orange-brown; bill, legs, and nails black. *b*, ♂: iris pale orange-brown; bill, legs, claws black. *c*, ♀: iris warm brown; bill and legs black.]

The four examples sent by Mr. Everett are in mature plumage. They are difficult to separate from the grey-backed form of India, *L. nigriceps*. The only apparent difference is, that in the Luzon bird the rufous of the uropygium and upper-tail coverts is not so bright, and that the grey on the back extends lower down. Dimensions about equal.

27. Lanius lucionensis (72).

[San Mateo. *a*, ♂: iris dark-brown; bill purplish leaden; legs dark bluish grey; claws black. *b*, ♂: iris dark brown; bill purplish leaden; legs bluish; claws dark brown. *c*, ♀: iris dark brown; legs dark lead; claws black; bill purplish brown.]

The two examples marked ♀ have the cheek-stripe brown, not black; and the pectoral feathers and upper tail-coverts are edged with brown.

28. Artamus leucorhynus (73).

[San Mateo. *a*, ♂: iris dark brown; bill whitish blue, tipped black; legs darkest lead-grey. *b*, ♂: iris chocolate; bill pale bluish; feet and claws black. *c*, ♂: iris dark brown; bill pale-bluish-grey, tipped black; legs darkest lead-grey; claws black. *d*, ♀: iris dark brown; bill pale whitish blue, tip black; legs dark leaden.]

29. GRAUCALUS STRIATUS (74).

[Monte Alban. *a*, ♂: iris pale lemon-yellow; bill, legs, and claws black.

San Mateo. *b*, ♂: iris pure lemon-yellow; bill, legs, and claws black.]

Two examples in uniform plumbeous plumage.

30. VOLVOCIVORA? CÆRULESCENS (75).

[Monte Alban. ♂: iris dark brown; bill, legs, and claws jet-black.] In full jet-black plumage.

31. LALAGE DOMINICA (76).

[San Mateo. *a*, ♂. iris dark brown; bill black. *b*, ♀: iris dark brown; bill and nails black; legs blackish-grey. *c*, ♀: iris dark brown; legs plumbeous.]

32. DICRURUS BALICASSIUS (80).

[Monte Alban. *a*, ♂: iris crimson; bill, legs, and nails, black. *b*, ♀: iris crimson; bill, legs, and claws, black.]

33. PHILENTOMA CYANICEPS (82).

[Monte Alban. *a*, ♂: iris rich dark brown; bill black; legs purplish brown. *b*, ♂: iris crimson; bill black; legs and feet brown.]

34. LEUCOCERCA NIGRITORQUIS (83).

[San Mateo. ♂: iris very dark brown; legs black; claws black.]

35. CYORNIS PHILIPPINENSIS.

Cyornis philippinensis, Sharpe, *t. c.* p. 325.

Cyornis banyumas (84 partim).

[Monte Alban. ♂: iris dark chocolate-brown; bill black; legs light brown.]

Five examples of a species of the genus *Cyornis* obtained at Monte Alban by Mr. Everett are distinguishable from *C. banyumas*, ex Java, by having the abdomen, vent, and under tail-coverts white and not rufous, and the rufous of the breast paler. Above no difference is discernible. A Zebu bird collected by Dr. B. Meyer (*t. c.* no. 84) differs from the Luzon in being of a darker shade of blue above, especially on the head, and in having the frontal and superciliary feathers and the wing-coverts darker blue. The Luzon examples are not separable from the type of *C. philippinensis* in the British Museum.

36. HYPOTHYMIS AZUREA (85).

[Monte Alban. *a*, ♂: iris chocolate-brown; bill blue, tip black; interior of gape pale yellow-green; legs lead-blue; nails black. *b*, ♂: iris dark brown; bill blue, tip black; legs lead-blue; nails black. *c*, ♂: iris dark brown; blackish blue; legs lead-blue. *d*, ♀: iris dark chocolate-brown; bill and nails black; legs dark grey.]

37. Butalis manillensis (86)?

[Monte Alban. ♂: iris dark brown; legs and claws black; bill dark vandyke brown, nearly black.]

A single example of a species of grey Flycatcher is sent by Mr. Everett, which, while resembling *B. griseosticta*, Swinh., still cannot be said to belong to that species. It is a larger bird with a wing measuring 3·56. The bill is narrower and longer, more like that of *B. grisola*. Above the plumage is of a paler purer grey and not grey-brown. The wing-lining and axillaries are grey rather than pale rufous. With doubt I refer this bird to *B. manillensis*, Bp.; for he states that the Manilla race is smaller than *B. grisola*, while this Luzon bird exceeds the European species in its dimensions. Mr. Sharpe (*t. c.* p. 326) identifies an example obtained in Panay by Dr. Steere with *B. griseosticta*[1].

38. Hirundo gutturalis (88).

[San Mateo. *a*, ♂: iris and feet dark brown. *b*, ♀: iris brown; bill, feet and nails black.]

39. Broderipus acrorhynchus (90).

[San Mateo. *a*, ♂: iris pale purplish-brown; bill dull pale crimson; legs dark lead-grey; claws black. *b*, ♂: iris white; bill dull pale crimson; feet bluish-lead; claws black. *c*, ♂: iris yellow; bill pale dull crimson; feet dark grey. *d*, ♂: iris purple-grey, outer ring white; bill pale crimson; legs lead-grey. *e*, ♀: iris purple grey; bill pale dull crimson; legs lead-grey.

Monte Alban. *f*, ♂: iris purple-grey; bill white, tinged crimson; legs lead-grey; claws blackish.]

Ten adult examples were obtained by Mr. Everett, seven males and three females. All the males have the middle pairs of rectrices jet-black, tipped with yellow. The same feathers in the females are washed with yellow; and the body plumage is not of so golden a tint.

40. Megalurus palustris (96).

[San Mateo. ♂: iris orange-brown; bill black; mandible lead-grey; legs horn-brown; claws dark ditto.]

Identical with individuals from Burma, Assam, Sylhet, Munipur &c.; but I have not been able to compare it with typical examples. The Bengal (Philippine?) example, described by Pucheran (Archives du Mus. vii. p. 342) as being one of the types of *Gracula caudata*, Cuvier, must belong to this bird and not to the *Timalia chataræa*, Frankl., of India; and, judging from Pucheran's remarks, the Javan bird, *Malurus marginalis*, Reinw. (= *Megalurus palustris*, Horsf.), although very close, appears to differ from the Indian bird. There is good reason to doubt the occurrence of *Timalia chataræa*, Frankl.

[1] Since these remarks were in print, I have had the advantage of perusing M. Oustalet's observations on the type specimen of *B. manillensis*, Bp., in the Paris Museum (Ois. de la Chine, p. 123), whereby it appears that that gentleman is also of opinion that *B. manillensis* is distinct from *B. griseosticta*.

(= *Gracula caudata*, Cuv., apud Blyth), in the Philippines. Both Jerdon and Blyth appear to have been misled into identifying Franklin's bird with the Cuvieran type by some remarks of Lafresnaye's (Mag. Zool. 1st series, *Timalia*). Lafresnaye gave Franklin's diagnosis (P. Z. S. 1830–31, p. 118) and wrote that *T. chatarœa* "nous a paru être le même oiseau que celui intitulé au Musée, *Gracula caudata* (Cuvier)." Lafresnaye described a bird in his collection and identified it with the type in the Paris Museum (said to have been obtained in Bengal by Dussumier in October 1820, but having, when Pucheran examined it, "Manilla" written on its label). And Lafresnaye's description (*l. c.*), and certainly Pucheran's of the type (already alluded to), will not apply to Franklin's bird. Blyth (Ibis, 1867, p. 6), in the belief that *T. chatarœa*, Franklin=*G. caudata*, Cuvier, mentioned, on Pucheran's authority, that it was found in the Philippines; and I inadvertently gave Franklin's species a place in my list of Philippine birds (*t. c.* no. 97) although I stated that Indian authors seemed to have been somewhat hasty in identifying *T. chatarœa* with *G. caudata*, Cuvier. *T. chatarœa* may, for the present, be safely eliminated from our lists of the Philippine fauna.

41. MEGALURUS RUFICEPS. (Plate LXXII.)

Megalurus ruficeps, Tweeddale, Ann. & Mag. N. H. ser. iv. vol. xx. p. 94 (1877).

♀. Lower surface white, faintly tinged with cream-colour on the breast. Flanks pale earthy brown. Under tail-coverts pale dingy isabelline rufous; thigh-coverts of a more decided rufous. Space before the eye and supercilium, passing well behind the eye, greyish white. Forehead, head, and nape, pure bright uniform rufous. Back olive-grey, each feather broadly centred by a longitudinal stripe of brown. Uropygium and upper tail-coverts uniform olive-grey. The base of the long and lax uropygial feathers pure dark grey, the tips only being olive-grey. Rectrices above dull ruddy brown, obsoletely barred with narrow brown lines. Quills brown, externally margined with ferruginous olive. Lesser wing-coverts olive-grey; greater tinged with ferruginous.

Wing 2·75 inches, tail 5·25, tarsus 1·0, culmen 0·56.

[Monte Alban. ♀: light clay-brown; bill brown, lower half grey; legs and feet whitish.]

42. IXUS GOIAVIER (99).

Monte Alban. *a*, ♂: iris bright brown; bill black; legs dark brown. *b*, ♂: bill, legs, and nails black. *c*, ♀: bill and legs black; iris brown.

San Mateo. *d*, ♀: iris dark brown; bill black; legs dark grey, almost black.]

All Mr. Everett's specimens (a series of eight) of this species have the ear-coverts dark brown, the only character apparently which separates it from *I. analis*. The plumage of the two sexes does not differ.

43. Hysipetes philippinensis (102).

[San Mateo. *a*, ♂: iris burnt-sienna brown; bill black; legs dark sepia-brown. *b*, ♀: iris burnt-sienna brown; bill black; legs dark plumbeous.
Monte Alban. *c*, ♂: iris burnt-sienna brown; bill black; legs and nails blackish grey.]

44. Monticola solitarius (103).

[Monte Alban. *a*, ♂: iris chocolate; bill, legs, and claws black; *b*, ♂: iris dark brown; bill and nails black; legs blackish brown.]
Lower breast and abdomen almost pure dark rufous, a few of the blue and rufous feathers with albescent tips. Above with albescent tips and subterminal black marks.

45. Pratincola caprata (104).

[Monte Alban. ♀: iris dark brown; bill, legs, and claws black.]

46. Copsychus mindanensis (106).

[San Mateo. *a*, ♂: iris chocolate; bill, legs, and claws black. *b*, ♂: iris dark brown; bill black; legs and claws very dark brown.
Monte Alban. *d*, ♀: iris chocolate-brown.]
The adult female is dark glossy bluish-grey above. The chin, cheeks, throat, and breast a purer dead grey. The white of the abdomen somewhat sullied with rufescent.

47. Corydalla lugubris (117).

[San Mateo. *a*, ♂: iris dark chocolate-brown; bill vandyke brown, lower half yellowish; legs ochreous yellow; claws pale grey brown. *b*, ♀: ? iris dark chocolate; bill sepia-brown; mandible yellow-brown; legs and feet brownish ochre-yellow; claws pale brown.]

48. Anthus maculatus.

Anthus arboreus, var. *japonicus*, Schlegel, Faun. Jap. pp. 58, 139, t. xxiii., "Japan" (1842).
Anthus maculatus, Hodgs. Gray's Zool. Misc. p. 83 (1844); Blyth, J. A. S. B. 1847, p. 433: conf. Brooks, Str. F. 1876, p. 278.
Dendromanthus maculatus (Hodgs.), Blyth, Cat. Calc. Mus. p. 135. no. 753.
Pipastes agilis (Sykes), Gould, B. of As. pt. xvii. t. — (April 1, 1865).
Pipastes maculatus (Hodgs.), Blyth, B. Burm. no. 224.
[Monte Alban. ♂, shot on the ground in the forest.]

49. Parus elegans.

Machlolophus elegans (118).

[Monte Alban. ♂: iris dark brown; bill black; legs grey.]
This is a true *Parus* and not a *Machlolophus* as was suggested by Mr. Blyth.

50. Calliope camtschatkensis (107).

[Monte Alban. ♂: iris dark brown; bill black, grey at base; legs and feet purplish grey.]

51. Phylloscopus borealis.

Phyllopneuste borealis, Blasius, Naumannia, 1858, p. 313.
Phylloscopus magnirostris, Blyth, apud Blyth, Ibis, 1870, p. 168; Walden, *t. c.* no. 109.

[Monte Alban. *a*, ♂: iris brown; maxilla dark brown; mandible yellow; legs and claws pale clear brown.
San Mateo. *b*, ♂: iris dark brown; legs raw-sienna brown; maxilla dark horn-brown; mandible horn yellow. *c*, ♀: iris brown; legs yellow-brown; bill brown; lower half yellow.]

As I anticipated (*t. c.*), the *Phylloscopus* from the Philippines, identified by Mr. Blyth with *P. magnirostris*, proves to belong to *P. borealis*. Four examples were obtained by Mr. Everett, in the month of February. The first alar bar is almost obsolete; but Mr. Dresser has no doubt that they belong to *P. borealis*, and they agree well with my own series of that species.

52. Orthotomus derbianus (112).

[Monte Alban. *a*, ♂: iris bright clay-brown; bill sepia; the mandible pale grey; legs and nails pale clear brown. *b*, ♂: iris bright clay-brown; bill dark brown; mandible grey; legs very pale transparent brown.]

Moore accurately described this species of *Orthotomus*; but in the figure the wings are coloured of too vivid a green. The wings are yellow-green.

53. Budytes viridis (114).

[Monte Alban in February.]

54. Calobates melanope (115).

[Monte Alban. *a*, ♂: iris brown; bill light vandyke brown; legs and feet pale transparent brown; nails vandyke brown. *b*, ♀: iris brown; bill dark lead-grey; legs pale transparent brownish grey. *c*, ♀: iris brown; bill dark brownish grey; legs very pale clear brown; claws vandyke.]

Average length of rectrices in five examples, 3·87.

55. Motacilla ocularis.

Motacilla ocularis, Swinhoe, Ibis, 1860, p. 55; P. Z. S. 1870, pp. 129, 130, woodcuts.

[Monte Alban. ♀, March: iris, bill, and legs dark brown.]

A single example with a grey back, a few dark feathers on the vertex, and a black pectoral plastron; forehead and a broad space over the eye white; a line passing from base of bill through the eye black.

56. Dicæum rubriventer.

Pipra papuensis, Gm. S. N. i. p. 1004. no. 21 (1788).
Dicæum rubriventer, Lesson, Tr. p. 303 (1831).
Dicæum retrocinctum, Gould, B. As. xxvii. t.—, inf.; Walden, *t. c.* no. 120. partim; conf. Salvadori, Ann. Mus. Civ. Genoa, viii. p. 509.

[Monte Alban. ♂: iris bright brown; bill glossy black; legs and nails dark brown.]

Not to be distinguished from Zebu examples.

57. Dicæum xanthopygium. (Plate LXXIII. fig. 1.)

Dicæum xanthopygium, Tweeddale, Ann. & M. N. H. ser. iv. vol. xx. p. 96 (1877).

♂. Above, cheeks and wing-coverts dark bluish slate-grey. An isolated dorsal patch crimson. Uropygium yellow. Chin, throat, and upper part of breast yellow. Remainder of breast, abdomen, and flanks orange. Ventral region, thigh-coverts, and under tail-coverts yellow tinged with green. Rectrices and quills dark brown; the primaries narrowly margined with white, the secondaries with olive-green.

Wing 1·96 inch, tail 1·06, tarsus 0·50, culmen 0·38.

[Monte Alban. ♂: iris dark brown; legs dark greyish-brown; bill black.]

This is a second Philippine representative form of *D. trigonostigma*, and, as an example of progress in the variation of a species, is interesting. It, together with *D. dorsale*, Sharpe, and the Malayan species form a small subgroup, the Luzon bird being hardly distinguishable from *D. trigonostigma*, as seen from above, and from the Panay species when seen from below. Is the Negros habitat of *D. trigonostigma* of Mr. Sharpe's list (*t. c.* p. 352. no. 171) reliable?

58. Myzanthe pygmæa (121).

[Monte Alban. *a*, ♂: iris dark brown; bill and legs black. *b*, ♂: testes greatly enlarged.]

59. Arachnechthra jugularis (123).

[Monte Alban. ♂: iris light brown; bill, legs, and nails jet-black.]

60. Corvus philippinus (125).

[San Mateo. *a*, ♂: iris dark brown; bill and legs black. *b*, ♀: iris pale wood-brown; bill, legs, and claws black.]

Three of the four examples sent by Mr. Everett have the wing an inch and a quarter to a half shorter than that of the fourth individual. This last is in full glossy purple-black plumage, while the three with short wings are in a state of transition from brownish unglossed black to purple-black. They belong to *C. brevipennis*, Schlegel.

61. Acridotheres cristatellus (126).

[Monte Alban. *a*, ♂: iris yellow; bill pale yellowish; legs dark brownish ochre-yellow; nails black.

San Mateo. *b*, ♂: iris golden yellow; bill yellow-white; legs

chrome; claws horn-brown. *c*, ♀: iris Indian yellow; bill light greenish-yellow; legs dull orange; claws brown.]

62. Sarcops calvus (129).

[Monte Alban. *a*, ♂: iris bright brown; bill and legs black; bare skin white tinged with pink.

San Mateo. *b*, ♂: iris rich chocolate-brown; bill, legs, and claws black. *c*, ♀: iris rich warm brown; bill black; feet and claws sooty brown; bare skin white tinged dull crimson.]

63. Munia jagori (132).

[San Mateo. ♀: iris red-brown; bill pale bluish-grey; legs darker grey.]

64. Oxycerca jagori (134).

[San Mateo. ♂: ?, iris Indian red; bill dull blue; legs blue-grey.]

65. Oxycerca everetti. (Plate LXXIII. fig. 2.)

Oxycerca everetti, Tweeddale, Ann. & Mag. N. H. ser. iv. vol. xx. p. 96 (1877).

♂ and ♀. Chin and throat dark brown; breast, flanks, and thigh-coverts warm nutmeg-brown. Abdomen and vent pure white, some of the lower breast-feathers being marked with brown, and some of the flank-feathers being white on their inner webs, brown on their outer, and with white shafts. Under tail-coverts very dark brown or black. Above, wings and coverts brown, each feather, except the frontal and upper tail-coverts, having a conspicuous pure white central line along the shaft, very prominent on the wing-coverts; some of the upper tail-coverts tipped with ochre. Rectrices brown, the middle pair broadly margined, the laterals less so, with yellow and greyish yellow. Inner edges of the quills pale rufous seen from underneath.

Wing 1·87 inch, tail 1·75, tarsus 0·56, culmen 0·38.

[Monte Alban. *a*, ♂: iris Indian red; bill black; mandible lead-grey; legs dark grey. *b*, ♀: iris Indian red; bill black; mandible and legs grey.]

This is a representative form of *Munia leucogastra*, Blyth, but quite distinct, being of a warm nutmeg-brown colour, and not dark sooty-brown, and having the white striæ of the upper plumage much more boldly defined.

66. Osmotreron axillaris (136).

[Monte Alban. *a*, ♂: iris bluish green; feet greyish green; nails grey; bill light green, base dark red. *b*, ♀: iris pale sea-green; bill green; base of maxilla red; feet whitish green; nails grey. *c*, ♀: iris light bluish-green; bill green; base of maxilla red; feet greyish green; nails grey.]

67. Phabotreron leucotis (140).

[San Mateo. *a*, ♀: iris grey; bill black; feet dull crimson;

claws brown. *b*, ♀: iris purplish-grey; bill black; orbital skin dull bluish; feet dull crimson. *c*, ♀: iris purplish grey; bill black; feet crimson; nails horn-grey.

Monte Alban. *d*, ♂: iris purple-grey; bill black; feet bright carmine; claws brown. *e*, ♂: iris brown; bill black; feet carmine.]

68. Turtur dussumieri (147).

[Monte Alban. *a*, ♂ *juv.*: iris dark ochre-yellow; bill greyish black; feet dull crimson. *b*, ♂ *juv.*: iris dark ochre-yellow; bill greyish-black; legs purple-brown. *c*, ♂, pairing: iris ochreous orange; bill greyish-black; feet dull crimson. *d*, ♀: iris brownish orange; bill black; nails brown; feet carmine; paddy and maize in the crop.]

The example marked a ♀ differs from the males, and agrees with the description given (*l. c.*) of a female ex Luzon obtained by Dr. B. Meyer. Two of the males are immature, the nuchal band not being completed, and all traces of the vinous colouring of the nape being wanting.

69. Phlogœnas luzonica (149).

[Monte Alban. *a*, ♂: iris greyish violet; bill black; legs dull crimson; nails grey. *b*, ♀: iris light greenish-brown; bill black; legs carmine. *c*, ♀: iris pale greyish-violet; bill greyish black; feet dull crimson; nails dark grey.]

The female is slightly smaller; and the pinkish-red colouring of the abdomen is much deeper in the male.

70. Chalcophaps indica (150).

[San Mateo. *a*, ♂: iris dark brown; legs dull crimson; bill orange-red.

Monte Alban. *b*, ♀: iris dark brown; bill orange-red; feet dull crimson. *c*, ♂: iris chocolate-brown; bill orange-red, base crimson; feet dull crimson.]

71. Geopelia striata (152).

[San Mateo. *a*, ♂: iris white; bill dull bluish; orbital skin white tinged blue; legs dull crimson. *b*, ♀: iris white; legs dull purple; bill dull blue; orbital skin ultramarine. *c*, ♀: iris whitish-yellow; bill blue, almost black; legs dull crimson; orbital skin pale ultramarine.]

These examples in no respect differ from Malaccan and Javan individuals and others from the island of Madura. Neither by their dimensions nor colouring can the sexes be distinguished.

72. Turnix ocellata (156).

[Monte Alban. *a*, ♂: iris yellowish white; bill greenish; legs greenish-yellow; nails grey. *b*, ♀: iris pale yellow; bill light greenish-yellow; legs the same. *c*, ♀: iris white; bill grey tinged greenish; legs light yellow; nails grey.]

A very fine species. The female is fairly depicted by Meyen; the

male, besides being much smaller, differs in having the throat almost white, each feather being but slightly tipped with brown.

	Wing.	Tarsus.	Culmen.
♂	3·87	1·00	0·75
♀	4·25	1·06	0·81

73. TURNIX FASCIATA.

Hemipodius fasciatus, Temm., Pig. & Gallin. iii. pp. 634, 757, "Philippines" (1815); Walden, *t. c.* p. 225.

[Monte Alban. *a*, ♂: iris white; bill blackish, base yellow; legs light greenish-yellow. *b*, ♂: iris white; bill greenish yellow; culmen black; legs and feet light greenish-yellow; nails grey. *c*, ♂: iris white; bill greenish yellow; legs yellowish-green; nails brown. *d*, ♀: iris ochreous yellow; bill and legs yellow tinged green, the bill clouded with blackish green. *e*, ♀: iris white; bill greenish chrome, the culmen clouded; legs greenish chrome.]

Mr. Everett has sent six specimens of a species of *Turnix* which agree well with Temminck's description. They are at once distinguishable from *T. pugnax*, ex Java, by the uniform broad light rufous patch on the nape, and by being much smaller, but otherwise are nearly allied. The abdomen in both sexes is white. From *T. rostrata* they differ still more.

	Wing.	Tarsus.	Culmen.
♂	3·00	0·87	0·50
♀	3·25	0·93	0·60

74. CHARADRIUS FULVUS (159).

[San Mateo. *a*, ♂: iris chocolate-brown; bill black; legs pale lead-grey. *b*, ♀: iris brown; legs light lead-grey.]

75. ÆGIALITIS DUBIA (162).

[Monte Alban. *a*, ♂: iris warm chocolate-brown; orbital ring pure orange; bill black, base orange; legs grey; nails black. *b*, ♂: iris brown; bill black; legs ochreous yellow; nails black. *c*, ♀: iris dark brown; bill black, base yellowish; legs purplish grey; breeding. *d*, ♀: iris dark brown; bill and nails black; legs ochreous yellow.]

Seven examples, in various stages of plumage, of what is undoubtedly typical *Æ. dubia* (Scop.) have been sent by Mr. Everett. A comparison made with these Luzon individuals and others of so-called *Æ. curonica* (Gm.) and *Æ. minuta* (Pall.), apud Jerd., from Europe and Asia (*conf.* Walden, Tr. Z. S. viii. p. 89), leaves me no other conclusion than that they all belong to one species. In dimensions examples vary considerably; but intermediate links occur uniting the smaller with the larger races. In markings and colouring there is little difference, and the proportionate length of the tertiaries to the first primary is very variable in birds even from the same locality. The species described by Mr. Blyth (Ibis, 1867, p. 164, no. 849) as *Æ. philippensis*, vera, is *Æ. peronii* (Tem.).

Dimensions.

	Wing.	Tarsus.	Bill.	
	in.	in.	in.	
1. Luzon. Feb. ♂ ...	4·37	0·95	0·75	Full dress: tertiaries shorter than 1st primary.
2. „ „ „ ...	4·37	0·95	0·75	Not quite full dress: tertiaries equal to 1st primary.
3. „ „ „ ...	4·50	0·88	0·68	Immature: tertiaries nearly equal to 1st primary.
4. „ „ „ ...	4·37	0·93	0·75	Immature: tertiaries equal to 1st primary.
5. „ „ ♀ ...	4·25	0·95	0·75	Full dress: identical with No. 1; tertiaries worn, nearly equal to 1st primary. "Breeding."
6. „ „ „ ...	4·25	0·95	0·82	Ditto.
7. „ „ „ ...	4·25	0·82	0·75	Immature: tertiaries equal to 1st primary.

76. GALLINULA CHLOROPUS (169).

[Monte Alban. ♂: iris bright blood-red; bill bright greenish-yellow; legs and feet grass-green.]

77. AMAURORNIS OLIVACEA (176).

[Monte Alban. *a*, ♂: iris bright blood-red; bill dark green; feet and legs yellow-brown. *b*, ♀: iris bright blood-red; bill light green; legs and feet light brown.]

78. HYPOTÆNIDIA TORQUATA (177).

[Monte Alban. *a*, ♂: iris bright blood-red; bill black; feet and legs brown. *b*, ♀: iris bright Indian-red; bill black; legs sepia-brown. *c*, ♀: iris bright red; bill black; legs very dark lead-grey.]

The sexes do not differ in their dimensions or plumage. The pectoral band appears when the bird is reaching maturity. The black-barred pectoral feathers become first suffused with olive-green or with rufous, the black and white bands showing through. These bars then become obliterated and the feathers become uniform olive-green, dashed with dark rufous. Ultimately the pectoral band becomes uniform chocolate-brown.

79. HYPOTÆNIDIA PHILIPPENSIS (178).

[Monte Alban. ♂: iris Indian red; bill warm brown; legs, feet, claws, light greyish-brown. February.]

The specimens sent by Mr. Everett, three males, are typical. In all, the black bands of the breast and abdomen are not very decidedly pronounced, though well marked on the flanks. In two the pectoral band is just indicated by the tips of some of the feathers being tinged with pale rusty-fulvous. In the third the white bands are coloured with rusty fulvous, but the black bands show through. In the ex-

ample which has the pectoral band least developed the nape is most rufous, and this is the case in a Celebean individual without a trace of a pectoral band, the nape being pure bright rufous, and in others from Queensland. The dimensions of birds from all three localities hardly vary.

80. RHYACOPHILUS GLAREOLA (182).

Shot in February and March.

81. TRINGOIDES HYPOLEUCUS (183).

[Monte Alban. *a*, ♂: iris brown; bill dark vandyke brown; legs greenish grey; nails black. *b*, ♂: iris brown; bill and nails black; legs greenish lead-grey.]

Shot in February and March.

82. GALLINAGO SCOLOPACINA (187).

[Monte Alban. *a*, ♂, February: iris brown; legs greenish grey; nails black.]

83. RHYNCHÆA CAPENSIS (189).

[Monte Alban. ♂, February.]

84. ARDETTA CINNAMOMEA (192).

[San Mateo. *a*, ♂ (adult): iris bright yellow; legs and feet bright olive-green; bill yellow shaded with olive-brown on the culmen; February. *b*, ♂ (not mature): iris bright yellow; bill greenish yellow, culmen to apex darkened with greenish brown; legs yellow-green; soles of feet yellow; claws light brown. *c*, ♀ (immature); iris golden yellow; legs and feet bright olive-green; bill greenish-yellow at base; culmen dark olive-brown; February.]

85. HERODIAS GARZETTA (195).

[Monte Alban. ♀, March: iris bright yellow; bill black, base yellow; legs black; feet greenish-yellow dotted with black; claws dark brown.]

Two examples are sent by Mr. Everett shot in March, and both marked ♀. One is in full breeding-plumage with two long occipital plumes, a fully developed pectoral tuft, and a long dorsal train. In the other these appendages are absent, the bill being black in both. In dimensions they agree; and they belong strictly to the race named *Ardea nigripes* by Temminck.

Wing 10·25 inches, tarsus 3·50, culmen 3·0.

86. BUTORIDES JAVANICA (197).

[Monte Alban. ♀: iris golden; bill black; lower half, cere, and orbital skin light yellow; legs green; soles orange; nails brown. March.]

Immature.

3. Remarks on *Felis tigrina*, Erxl., and its Synonymy. By D. G. Elliot, F.R.S.E. &c.

[Received June 28, 1877.]

Erxleben, in his 'Systema Regni Animalis,' published in 1777, described a Cat from Guiana, Cayenne, &c. as *Felis tigrina*, characterized as having a long tail, fulvous fur on the body spotted and striped with black, beneath white. This animal is much smaller than *F. pardalis*, and differs also in style of its marking, rather difficult to explain in words; but generally the black is more inclined to take the form of spots than lines or stripes. There is no doubt whatever that the two belong to very different and distinct species.

In 1820, in the 'Histoire Naturelle des Mammifères,' MM. Cuvier and Geoffroy St.-Hilaire described another Cat of this form as *Felis mitis*, from Brazil, characterized by having a tail about half the length of the body and head, with a general buff colour, and spotted irregularly with black, the centres of the spots of light buff.

In 1826 Prince Maximilian of Neu-Wied, in his 'Beiträge zur Naturgeschichte von Brasilien,' also described a species of *Felis*, distinguished by having the tail as long as the body. In other respects, such as the general colour of the fur, together with the shape, disposition, and hue of the spots, it does not vary more from the two animals mentioned above than do individuals of any species of Spotted Cats from each other. With the exception of Erxleben, who gives a general habitat for his animal, such as "America Australis," citing the Cayenne Cat of Pennant, and the Tiger Cat of Guiana, Bauer, as synonymous, the authors mentioned ascribe Brazil as the habitat of their respective species. For a long time the animals called by these different names, bestowed upon them by their describers, gave me a great deal of trouble, as I strove to find recognizable and permanent differences by which the species, if they really were such, could be discriminated.

The late Dr. J. E. Gray, in his papers on the Felidæ, especially in his 'Catalogue of the Carnivorous, Pachydermatous, and Edentate Mammalia,' although he states that the three species vary greatly in the size, form, and disposition of the spots (to which he might have added colour), endeavoured to keep the three apart by the "kind" and colour of the fur and the colour and length of the tail. Thus *F. macroura* and *F. mitis* have *soft* bright fulvous fur and tail distinctly ringed; and *F. tigrina* has a *harsher* grizzled fur, and the tail marked with a series of dark spots, not forming distinct rings. In regard to the distinction given to the fur as it feels to the touch, I may not have the sensitiveness necessary to enable me to appreciate the character; but the fur of all the animals belonging to this particular type of *Felis* appears to me to have a similar texture, and I hardly consider that the softness or harshness of the hair will be sufficient to render the animals specifically distinct or to enable them to be recognized by that character.

F. macroura, as its name implies, has for the most part relied upon the length of its tail to establish its claim to a distinctive rank; and so far as I can discover, leaving aside some slight differences of colour, *F. mitis* must be recognized by having a tail intermediate in length between *F. macroura* and *F. tigrina*. Although I have carefully examined and compared specimens of the alleged species in most of the large collections in Europe and also in that of the Smithsonian Institution at Washington, I had been utterly unable to find any reliable character to distinguish them from each other. On a recent visit to London (one of the chief objects of making which was to further investigate this subject) in company with my friend Mr. E. R. Alston, who was occupied with the Felidæ inhabiting Central America, I examined anew the entire collection of these so-called three species, consisting of skins, mounted specimens, and skulls, contained in the British Museum. These are, in all, nineteen specimens, coming from various localities between Honduras on the north, and Paraguay on the south.

As the length of tail was a principal character, especially for *F. macroura*, this member was our first consideration; and it very soon proved to be, as I had always found was the case, thoroughly unreliable; for the tails were of all possible lengths, irrespective of locality, and if arranged in a series would exhibit a gradual progression from the shortest to the longest and most pretentious. The next step was the arrangement of the spots or rings, mindful of Dr. Gray's descriptions of rings distinct and rings indistinct. Both kinds were found; in fact a third style was discovered; for, while some had tails incompletely ringed, and others tails with some perfect rings, others, again, had spotted tails without any tendency at all to form any kind of ring. No two were exactly alike, even from the same place, while others from far distant localities bore a more general resemblance to each other than some that had the same habitat. As to colour, one had but to choose the shades of buff or grey that pleased him best; for apparently all were represented, and it was difficult to find the same hue on two individuals.

The tails proving to be miserable failures in every way for specific distinction, we next turned our attention to the bodies and heads, and were at once met with the same difficulties; for the animals had as great a disregard for uniformity in the colour of their fur and in the patterns of the markings on their bodies as they evidently had for that on their tails. All hues of grey and buff were exhibited, every shape and size of spots were there, some solidly black, others with light centres and black edges, scattered about separately or coalescing and forming stripes, but without regularity of pattern, and no two examples exactly alike from any or all localities. It was very evident that if there really did exist three species there must be some other means to distinguish them; for of all the characters that had been given of the colour and style of markings, it was very evident that none were of any value whatever; and as a last resort we turned to the skulls.

Here, also, our efforts met with no better success; for variations

also existed in these, mainly, however, in size: no two were precisely alike from any locality; and there did not exist any single reliable character that could be given by which more than one species could be established and recognized. I therefore feel no hesitation in stating that there exists but one species of Spotted Cat, commonly known as the Margay, belonging to the New World, and that the animals generally known as *F. macroura*, Pr. Max., and *F. mitis*, Cuv., are identical with it, and that these names must become synonyms of *Felis tigrina*. I have always found it unsafe to decide upon any species of Spotted Cat from a single specimen, unless accompanied by some trenchant character exhibited in the skull which would permit it readily to be distinguished; and this, I may remark, is very rarely to be found among the Felidæ.

All the species of *Felis* from both the Old and New Worlds vary so greatly in different examples that one is often tempted to believe a distinct species, perhaps a new one, is before him; and it is only in a series of examples that it can be seen how the so-called species run into each other, and that what may have appeared a strong specific character becomes of no real value whatever. The same species frequently ranges over many degrees of latitude; and the individuals of northern regions are observed to be clothed with long thick fur as a protection against the severity of the climate, and, although presenting outwardly a very different appearance from their smooth short-coated brethren of the tropics, should not, on that account, be elevated into distinct species.

The following synonymy shows the more prominent names that should be placed under the head of *F. tigrina*.

Felis tigrina, Erxl. Syst. Regn. Anim. (1777) p. 517, sp. 11; Gmel. Syst. Nat. (1788) vol. i. pt. 1, p. 80, sp. 13; F. Cuv. Hist. Nat. Mamm. (1826) vol. ii. pl. 144; Temm. Mon. Mamm. (1827) vol. i. p. 153; Fisch. Syn. Mamm. (1829) p. 204, sp. 16; J. E. Gray, Proc. Zool. Soc. (1867) pp. 271, 404; id. Cat. Carn. Mamm. (1869) p. 22.

Cayenne Cat, Penn. Hist. Quad. (1781) p. 271, sp. 163.

Guigña Cat, id. ibid. (1793) p. 299, sp. 198.

Felis guigña, Molina, Sagg. Stor. Nat. Chili, (1810) p. 244, sp. 6; Desm. Dict. Hist. Nat. (1816) p. 114; Philippi, Wiegm. Arch. (1873) p. 8, tab. ii. & iii. figs. 2 & 3.

Felis margay, Azara, Nat. Hist. Quad. Parag. (1838) p. 237.

Felis (*Noctifelis*) *guigña*, Severtz. Rev. & Mag. Zool. (1858) p. 386.

Felis mitis, F. Cuv. Nat. Hist. Mamm. (1820) vol. ii. pl. 137; Azara, Nat. Hist. Parag. (1838) p. 226; Burm. Syst. Uebers. Thier. (1854) p. 86; J. E. Gray, Proc. Zool. Soc. (1867) pp. 271, 404; id. Cat. Carn. Mamm. (1869) p. 22.

Felis chati, Griff. Anim. King. (1827) vol. ii. p. 479, pl.

Felis smithii, Swains. Anim. in Menag. (1838) p. 120.

Leopardus mitis, J. E. Gray, List Mamm. Brit. Mus. (1843) p. 42.

Felis macroura, Pr. Max. Beitr. z. Naturg. Bras. Band ii.

(1826) p. 371; Fisch. Syn. Mamm. (1829) p. 203, sp. 12; Less. Suppl. Buff. (1847) p. 113; Burm. Syst. Uebers. Thier. Bras. (1854) p. 87; J. E. Gray, Proc. Zool. Soc. (1867) p. 271; id. Cat. Carn. Mamm. (1869) p. 22.

Felis brasiliensis, F. Cuv. Hist. Nat. Mamm. (1828) vol. ii. pl. 139.

Felis elegans, Less. Cent. Zool. p. 69, pl. 21.

Leopardus tigrinoides, J. E. Gray, List Mamm. Brit. Mus. (1843) p. 42.

Panthera brasiliensis, Fitz. Sitzungsb. Akad. Wiss. Wien, (1869) lix. p. 236.

Panthera macrura, id. ibid. p. 242.

Panthera venusta, id. ibid. p. 244.

Hab. Central America southwards to Paraguay.

4. On some Points in the Visceral Anatomy of the Rhinoceros of the Sunderbunds (*Rhinoceros sondaicus*). By A. H. Garrod, M.A., F.R.S., Prosector to the Society.

[Received October 1, 1877.]

Our present knowledge of the visceral anatomy of the Rhinocerotidæ is confined to that of the two species *Rhinoceros unicornis* and *Ceratorhinus sumatrensis*. Professor Owen has given us, in the 'Transactions' of this Society (vol. iv. pp. 31 *et seq.*) an exhaustive account of the former of these animals; and in the 'Proceedings' (1873, pp. 92 *et seq.*) it has been my endeavour to indicate most of the important features in the latter, which, as Prof. Flower has kindly pointed out to me, were briefly described by Sir E. Home in the 'Philosophical Transactions' (1821, p. 271). On the present occasion I bring before the Society my notes on a young female of the Sondaic Rhinoceros (*Rhinoceros sondaicus*), which died in the menagerie of Mr. C. Jamrach, after having been in this country for a little more than half a year. It was only the skinned trunk which came into my possession. It is the nature of the mucous membrane of the small intestine which was certain to be of greatest interest; and this I am able to describe in detail.

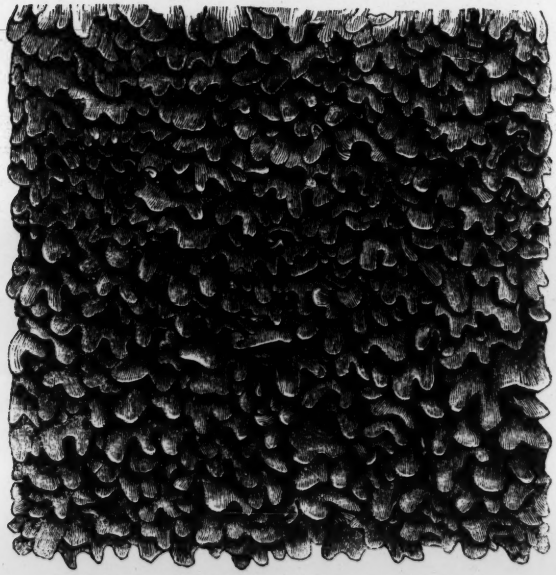
The individual under consideration measures, stuffed, six feet two inches from the tip of the nose to the base of the tail. The tail itself is a foot long, whilst the height of the animal at the shoulder is three feet. From the middle of the occipital crest, along the curve of the superior surface of the skull, to the tips of the nasal bones is thirteen and a half inches, the same measurement in adult animals being twenty-two inches.

The single milk-incisor on each side of each jaw is still in place, as are all the milk-molars. The first true molar has not cut the gum; but its cap is seen within the bony alveolus. No traces of the other molars are visible.

Mr. E. Gerrard has kindly lent me the skull for examination. In its base it exhibits the characteristic peculiarities of the species so clearly enunciated by Prof. Flower[1], the vomer being free behind and developed into a tongue-shaped process; the mesopterygoid fossa being expanded, and the free ends of the pterygoids everted at the same time that they are broad. No second combing-plate is present on the uncut first upper molar tooth.

The animal is too young to be contrasted advantageously with Prof. Peters's drawing[2] of *Rhinoceros inermis*, Lesson. I have, however, taken the opportunity of comparing that figure with the skulls of *R. sondaicus* in the College-of-Surgeons' Museum, and fail to see

Fig. 1.



Mucous surface of duodenum of *Rhinoceros sondaicus*.

that there are sufficient differences to justify specific differentiation. Prof. Flower had previously done the same, and had arrived at a similar conclusion, as he found that even greater differences than those pointed out by Prof. Peters are to be detected in individuals which are all undoubtedly of Indo-Malay origin.

[1] P. Z. S. 1876, p. 447.
[2] Monatsb. der königl. Akad. zu Berlin, 1877, p. 68, pl. ii.

In skin-folding and surface-texture the Sunderbund and Javan specimens agree exactly; the young Sunderbund animal presenting a most striking uniformity in the size of the epidermic tuberculation, except in the gluteal region, where the boiler-bolt-shaped tubercles are somewhat larger than elsewhere. Along the back the scattered brown hairs, which spring from the yielding linear intertubercular surfaces, are also well developed.

Fig. 2.



Mucous surface of ileum of *Rhinoceros sondaicus*.

The following are the lengths of the alimentary viscera:—

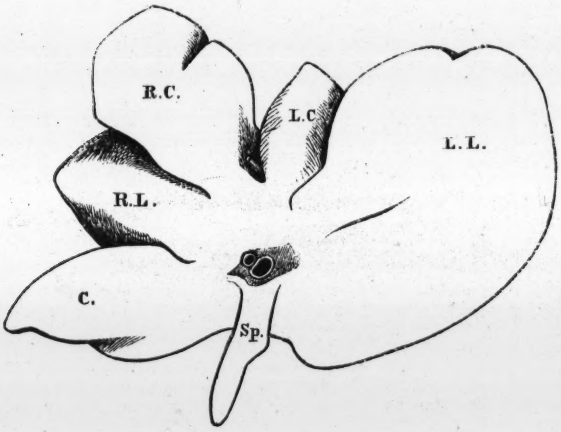
Small intestine, 26 feet 2 inches.
Large intestine, 9 feet 10 inches.
Cæcum, 1 foot 3 inches.

The stomach, in shape, is very much like that of *R. unicornis* as figured by Prof. Owen. Its cardiac surface is lined with the smooth white squamous epithelium found in all the Perissodactyla. This occupied about one third of the total gastric area, extending along most of the lesser curvature, the rest being covered with a smooth

and thick digestive coat. There is no trace of any œsophageal valve like that found in the Horse.

The small intestine is somewhat larger in the duodenal region than elsewhere. Its first three inches are destitute of the flattened papillæ found elsewhere; but here, as all along the small intestines, minute villi are present everywhere. Three inches from the pylorus the papillæ commence, and resemble those similarly situated in *Rhinoceros unicornis*[1], except that they are not quite so long. They are re-

Fig. 3.



Liver of *Rhinoceros sondaicus*. Visceral surface.
L.L. Left lateral. *L.C.* Left central. *R.C.* Right central. *R.L.* Right lateral. *C.* Caudate. *Sp.* Spigelian lobe.

presented in fig. 1 (p. 708), where they are seen to consist of flattened, round-tipped processes of the mucous membrane, several of which are blended at their bases, in transverse lines. None are more than ·3 of an inch in length, and most about ·6 inch broad where they first become free. They give the impression of being incomplete valvulæ conniventes which have been cut and deeply jagged at their free edges. The opening of the bile-duct is 7 inches from the pylorus, being a nipple-like tubular projection, nearly an inch long, among the papillæ. From the spot where they commence, all the way to the ileo-cæcal valve, these papillæ are found—those near the last-named situation differing from those in the duodenum in being more scattered and freer from one another, many in the ileum springing independently from the mucous membrane. Nowhere,

[1] *Vide* Prof. Owen's figure, Trans. Zool. Soc. vol. iv. pl. xii. fig. 1.

however, are they otherwise than flattened, broad, and blunt-tipped, none anywhere being circular and slender like those in the ileum of *R. unicornis*[1], the existence of which I have had the opportunity of verifying. They never exceed ·3 of an inch in length. Numerous Peyer's patches exist in the ileum, as may be inferred from fig. 2 (p. 709) which is a representation of a portion of the inner surface of the small intestine quite close to the ileo-cæcal valve.

Such being the case, *R. sondaicus* differs from *R. indicus* in that the papillæ of the ileum are short, flat, and broad, instead of long, cylindrical and narrow, "like tags of worsted" (Owen).

The cæcum coli is a short blunt cone, with the diameter of its base as great as its length (1 foot 3 inches); and comparing the disposition of the colic flexures and proportionate diameter, I found them identical with those of the Sumatran species as I have figured them[2].

The liver wants the gall-bladder, and differs but little from that of the Sumatran species. Fig. 3 (p. 710) is an outline-sketch of its abdominal surface, which, when compared with that of *Ceratorhinus sumatrensis* (P. Z. S. 1873, p. 102), shows that the right central lobe is larger than the right lateral, instead of smaller. The spigelian lobe is equally long and slender.

The pancreas is of good size and fairly concentrated.

The uterus is bicorn, each cornu measuring 8 inches, at the same time that the corpus uteri is 3 inches long. Each ovary is situated in a pocket of the peritoneum.

5. Note on an Anatomical Peculiarity in certain Storks. By A. H. Garrod, M.A., F.R.S., Prosector to the Society.

[Received October 1, 1877.]

The Ciconiidæ, whilst presenting great uniformity in their myology, differ among themselves in one feature which seems to me to be of sufficient interest to deserve special record, as it may aid those who study their external characters to arrive at a more satisfactory determination of their affinities among themselves.

The following are the species I have had the opportunity of dissecting:—

Ciconia nigra.
—— *alba.*
—— *boyciana.*
—— *maguari.*
Abdimia sphenorhyncha.
Xenorhynchus australis.
—— *senegalensis.*
Leptoptilus crumeniferus.
—— *argala.*
Tantalus ibis.

In all these birds, with the exception of *Abdimia sphenorhyncha* and *Xenorhynchus senegalensis*, I have found the ambiens muscle, which courses obliquely through the front of the capsule of the knee,

[1] Trans. Zool. Soc. vol. iv. pl. xii. fig. 3.
[2] P. Z. S. 1873, pp. 99, 100.

present, although never large; whilst in the two last-named birds, both from Africa, it is absent on both sides of the body. Such being the case, it seems to me highly probable that the relationship between *Abdimia sphenorhyncha* and *Xenorhynchus senegalensis* is more intimate than that between *X. senegalensis* and *X. australis*; and this view is favoured by their geographical distribution.

The tendency of the ambiens muscle to vanish in certain of the birds so closely allied as the Storks under consideration, in certain Psittaci, as well as in some of the Columbæ, is one which our knowledge of their habits does not enable us to explain. It can have no relation to the habits or bulk of the species; for this muscle is present in the Ostrich as well as in the smallest Cuckoo, whilst it is absent in the Cassowaries and the Passeres. The fact that it is not found in certain Storks makes its total loss in the Ardeidæ less surprising than it would otherwise be.

6. On the Shells of Lake Nyassa, and on a few Marine Species from Mozambique. By Edgar A. Smith.

[Received September 29, 1877.]

(Plates LXXIV. & LXXV.)

The British Museum has recently acquired a small series of shells collected by Mr. F. A. Simons at Lake Nyassa, and a few obtained by him at the mouth of the Macusi river, near Quilimane, on the east coast of Africa.

Among the former are several very interesting though small species, which, as far as I have been able to ascertain, are undescribed.

As complete lists of species from restricted localities are very useful, I have brought together all those which are known inhabitants of the lake. Fourteen, collected by Dr. Kirk, are all that have as yet been recorded; and now I am enabled to add eleven others to that number.

Of these the *Melania polymorpha* is very remarkable, as showing the great variation to which some *Melaniæ* are subject; and, indeed, I do not feel at all certain that the two forms, *M. pupiformis* and *M. turritospira* are not very abnormal growths of the same shell.

I. Lake-Shells.

1. Melania tuberculata, Müller.

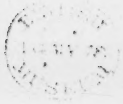
Hab. Lake Nyassa (*Simons* and *Dr. Kirk*).

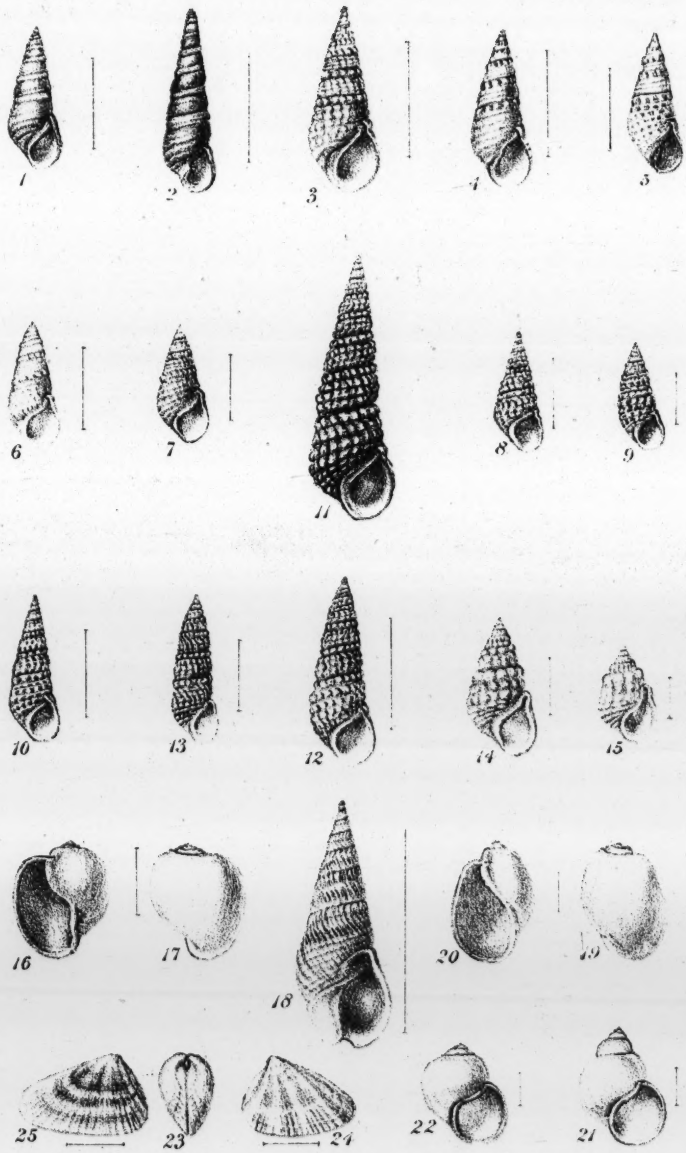
Four specimens of this variable species from the lake differ from the normal and usual form in having the whorls less convex. There is a narrow white zone at the top of the whorls next the suture; and beneath a pale-olive epidermis the shell is semitransparent, whitish, and ornamented with series of minute red dots. The longitudinal ribs



G.Sowerby lith. Hanhart imp.

NEW SHELLS FROM LAKE NYASSA & MOZAMBIQUE.





G. Sowerby lith. Hanhart imp.

NEW SHELLS FROM LAKE NYASSA & MOZAMBIQUE

are fine, and about eighteen on a whorl, those on the penultimate volution bearing about eight nodules.

2. Melania turritispira. (Plate LXXV. figs. 14, 15.)

Shell small, turreted, ovately fusiform, pale olive; whorls seven or eight, flat, with a raised infrasutural belt, furnished with coarse ribs, and sculptured with a few spiral striæ, nearly obsolete on the upper whorls, except the one which marks off the raised band at the suture; on the body-whorl the ribs become obsolete at the middle, where it is angulated, and the transverse striæ are about eight in number; the three or four upper ones crossing the costæ give them a somewhat nodose appearance; aperture small, subovate, acuminate above.

Length 8 millims., diam. 3¼. Aperture 3 long.

This curiously short stunted-looking species is remarkable for its peculiar form, the turreted spire, and the strongly developed nodulous upper extremities of the longitudinal ribs forming an infrasutural belt.

Certain varieties of *M. polymorpha* approach the present species in the style of sculpture; but the very different form of the latter and the absence of spotting easily distinguish it.

The specimens now described may not be full-grown; but it is to be presumed that larger examples would still exhibit the same short stunted form.

3. Melania pupiformis. (Plate LXXV. fig. 13.)

Shell cylindrical, subpupiform, covered by a greyish epidermis; whorls nine, flattish, constricted just beneath a raised belt at the suture, somewhat turreted, separated by a deep suture, furnished with coarse flexuous ribs, which are nodulous at the upper extremities through being crossed or intersected by a spiral furrow a little beneath the suture; below this there are faint indications of one or two other transverse striæ, giving the ribs a subnodose appearance. On the body-volution the ribs are almost obsolete; but around the middle two or three spiral sulci are more distinct than those on the upper portion of it. Aperture small, acutely ovate, occupying less than one third of the whole length of the shell.

Length 11 millims., diam. 3½. Aperture 3½ long.

The cylindrical pupoid form of this little species is very remarkable. The last three whorls are of about the same diameter; and above these the spire rapidly diminishes, forming a short cone at the apex. The ribbing is very strong for so small a shell.

Only two examples of this species have come under my observation; but Mr. Simons informs me that he has seen several others, and among them some which were larger than that now described.

4. Melania simonsi. (Plate LXXV. fig. 3.)

Shell acutely pyramidal, thinnish, whitish spotted with red; whorls 9-10, divided by a deep, slightly oblique suture, but little convex, furnished with obliquely arcuate granulous ribs, which num-

ber about sixteen in the last whorl; the granules are produced by transverse sulci, which cut the ribs at right angles; they are squarish and four or five in number on the ribs of the upper whorls, and the same on the body-whorl, where they terminate about its middle, beneath which the spiral ridges between the sulci are simple, and rather finer than those at the upper part of the volution; aperture acuminately ovate, occupying rather more than one third of the entire length of the shell.

Length 18 millims., diam. 6½.

This species must not be confounded with *M. nodicincta*, Dohrn, also found at Lake Nyassa. Although in sculpture there is certainly much resemblance, the very different form and proportion of the whorls indicate the specific distinctness of this pretty shell. The spire is produced to quite an acute apex; and its outlines are rectilinear. The nodules on the ribs are large for the size of the species, squarish, and in oblique curves. The red dots are for the most part situated in the interstices between the ribs, at the base of each nodule, thus forming both longitudinal and transverse series.

5. MELANIA POLYMORPHA. (Plate LXXV. figs. 4–10.)

Shell elongate, pyramidal, thin, under a pale-olive epidermis, whitish, spotted with reddish brown; whorls 8–9, almost flat, sometimes somewhat convex, margined above at the suture, which is deep and subcanaliculate, either with or without longitudinal plicæ, nodulous through being intersected by a few transverse striæ; the plicæ are usually only on the upper whorls, but in some specimens there are traces of them on the last, or they are well developed; the body-whorl is generally sculptured with 3-4 spiral sulci at the periphery, and by other less distinct striæ above and below it; aperture ovate-acuminate above, varying in length, occupying either a little more or less than half the entire shell, pale horn-colour, spotted with reddish brown.

Length 16 millims., diam. 5½. Another specimen 14 millims. long, and 4⅓ wide.

The form of this species is subject to great variation; and the extremes, taken apart from intermediate varieties, have decidedly the aspect of distinct species. The sculpture is also very different in certain specimens, some being almost smooth, with the exception of the spiral sulci on the body-whorl, and a few less distinct striæ on this and the upper volutions. Others are distinctly ribbed, the ribs being cut across by two spiral striæ in the upper whorls, thus producing three granules on each rib, the uppermost situated at the suture on the thickened margin. This incrassation is constant in all specimens; and so is the deep suture, which gives the spire a turreted aspect. Six small examples have the thickened margin very strongly developed, the longitudinal ribs particularly granulous, and present on the body-whorl, terminating at the periphery, where they are limited by a few distinct spiral sulci.

The disposition of the reddish-brown spotting and markings is not constantly the same. Generally a series of dots, short, rounded,

or elongate, becoming a short line, is situated on the raised infrasutural thickening, and beneath this two transverse series, sometimes coalescing and forming a short line. On the body-whorl there are other series below the middle, which also in some shells unite and form short flames.

6. MELANIA NYASSANA. (Plate LXXV. figs. 1, 2.)

Shell acutely pyramidal, dark madder-brown, thin, somewhat shining; whorls nine, margined beneath the suture by a distinct raised band, which is marked off by a spiral striation, convex infeferiorly, and somewhat constricted above; the few upper whorls with faint longitudinal ribbing, the rest smooth, with a few distant impressed spiral lines, only faintly visible on most of the whorls, but well defined around the base of the last; aperture rather small, madder-brown, oval, acuminate above, occupying about one third the entire length of the shell; columella arcuate, joined to the outer lip by a thin callosity overspreading the body-whorl.

Length 14 millims., diam. $4\frac{1}{2}$.

Var. Shell narrower, more cylindrical and elongated, the mouth occupying about one fourth of the entire length. Length 20 millims., diam. $5\frac{1}{3}$ (fig. 2).

This species is very distinct, on account of its dark madder-brown colour, which is almost uniform, except that the raised band beneath the suture is generally paler brown. The spiral striæ are very indistinct on the upper whorls, especially near the middle; but just below the periphery, and at the base of the ultimate whorl, they become well defined.

The variety is represented by a single shell, and in all probability is an abnormal growth; for in all respects, with the exception of its greater length and more cylindrical form, it is identical.

7. MELANIA NODICINCTA, Dohrn. (Plate LXXV. figs. 11, 12.)

Melania nodicincta, Dohrn, P. Z. S. 1865, p. 234.

Hab. Lake Nyassa (*Dr. Kirk*).

8. LANISTES OVUM, Peters.

"*Lanistes ovum*, Peters," Troschel, Wiegmann's Archiv, Jahrg. xi. Bd. i. (1845) p. 215; Philippi, in Kuster's Con. Cat. p. 22, pl. 6. f. 2, pl. 7. f. 7; Martens, in Pfeiffer's Novitates Conchol. (not seen by me).

Hab. Mozambique (*Peters*), Lake Nyassa (*Kirk*), *teste* Dohrn.

9. LANISTES NYASSANUS, Dohrn. (Plate LXXIV. figs. 8, 9.)

Lanistes nyassanus, Dohrn, P. Z. S. 1865, p. 233.

Two young shells, one about an inch in length, and the other half that size, were the only ones collected by Mr. Simons. Both have the spire completely flattened, and a distinct though rather narrow umbilicus, which, in the adult state, becomes closed by the reflexion of the columellar callosity.

10. LANISTES SOLIDUS, sp. nov. (Plate LXXIV. figs. 10, 11.)

Shell thick, solid, imperforate when adult, globosely ovate, yellowish olive, with the faintest indication of spiral linear bands, smooth with the exception of roughish lines of growth and most minute (almost obsolete) spiral striæ not visible to the naked eye; whorls 4½, with a broad shallow depression or excavation above, then very convex; last whorl large, ventricose, rapidly enlarging towards the aperture, the latter pyriformly ovate, purplish, or golden and iridescent within, golden towards the lip and on the columella, which is thickened and reflexed over the umbilical fissure; operculum horn-colour, concave exteriorly, with the internal scar roughly corrugated.

Length 42 millims.; diam. of last whorl, above the aperture, 30. Length of aperture 30, diam. 20.

Another specimen is 39 millims. long, 28 wide, and its aperture 30 in length and 18½ in width.

L. nyassanus of Dohrn is very like the present species in some respects. In solidity, in the absence of an open umbilicus, and in texture it is similar. But the vast difference of form is of itself quite sufficient to separate the two varieties. Neither can *L. solida* be the young state of Dohrn's shell, because the specimens before me have all the appearance of being mature, being solid and very heavy for their size; and on comparison with young examples of that species also obtained by Mr. Simons, the specific distinctness is at once observable.

11. LANISTES AFFINIS, sp. nov. (Plate LXXIV. fig. 7.)

Shell ovate, thin, widely umbilicated, greenish olive, with a narrow yellow line winding around the top of the whorls at the suture, smooth, shining, sculptured with oblique lines of increase and most minute spiral striæ, which are only visible under a lens; whorls five, convex; aperture ovately pyriform, purplish, and iridescent within, becoming yellow at the lips and columella, which is very slightly reflexed.

Length 38 millims., diam. 27½. Length of aperture 26, width 16½.

This species may be known from *L. solida* by its more prolonged spire, which consists of half a whorl more than in that species, and by its open umbilicus, which gives the last whorl a very different form.

L. ovum, Peters, is another closely allied form, and at first sight might easily be confused with this species. The latter has a shorter and less conical spire, consists of half a whorl less, and its body-whorl and aperture are longer.

12. PALUDINA JEFFREYSI, Frauenfeld. (Plate LXXIV. figs. 1, 2.)

Vivipara jeffreysii, Frfld. P. Z. S. 1865, p. 659.

This species was first found at Lake Nyassa by Dr. Kirk. The specimens collected by Mr. Simons do not quite accord with Frauenfeld's diagnosis. This author has omitted to mention that the en-

tire surface is covered with faint spiral striæ, which are distinctly visible to the naked eye. The very shallow depression around the middle of the body-whorl in the type specimen I am inclined to regard as an individual pecularity, and not a specific character: for there is no trace of such a furrow in any of the shells just received. These, for the most part, have the spire rather more elongated than the type, and the umbilicus a trifle narrower.

13. PALUDINA CAPILLATA, Frauenfeld. (Plate LXXIV. figs. 3, 4.)

Vivipara capillata, Frfld. P. Z. S. 1865, p. 659.

Hab. Lake Nyassa (*Dr. Kirk*).

14. PALUDINA ROBERTSONI, Frauenfeld. (Plate LXXIV. figs. 5, 6.)

Vivipara capillata, Frfld. *l. c.*

Hab. Same as preceding species.

15. PALUDINA POLITA, Frauenfeld.

Paludina polita, Frfld.; Reeve, Conch. Icon. xiv. sp. 73, fig. 73; Dohrn, P. Z. S. 1865, p. 233.

Hab. South Africa (?). Lake Nyassa (*Dr. Kirk*).

16. BYTHINIA STANLEYI, sp. nov. (Plate LXXV. figs. 21, 22.)

Shell small, ovate, rather solid, subrimate, dirty white or yellowish, obliquely striated by the lines of growth; whorls four, slowly increasing, very convex; suture simple, rather deep; mouth subcircular, occupying about half the whole length of the shell; peristome stout, thickened.

Length 5 millims., diam. $3\frac{1}{3}$.

Hab. Lake Nyassa.

The solidity, very convex whorls, and subcircular aperture, are the chief distinguishing characteristics of this little shell. The operculum, of course, takes the form of the mouth, and has the lines of increment rather coarse near the margins.

I dedicate this little shell to Mr. Henry M. Stanley, as a mark of admiration of his undaunted perseverance and achievements in African exploration.

17. PHYSA NYASSANA, sp. nov. (Plate LXXV. figs. 16, 17.)

Shell solid, pale olive-brown, narrowly perforate, somewhat triangular, roundly angulated above, and with a very short depressed spire; whorls five, convex, separated by a deep channelled suture, and sculptured by fine lines of growth; last whorl very large, occupying almost the entire length of the shell, since the spire is very shortly conical and only slightly elevated; aperture large, only a trifle shorter than the whorl, subauriform; columella thickened and a little reflexed, subtortuous, and connected with the upper extremity of the outer lip by a thin callous deposit upon the whorl.

Length 10 millims.; diam., with aperture, 8½; length of aperture 9, diam. 4.

Hab. Lake Nyassa.

This species is remarkable on account of its solidity, the short subtriangular form, and the small spire, which rises but very little above the rounded angle or shoulder of the last whorl.

The columella is nearly perpendicular, with a slight sinuosity inferiorly.

18. PHYSA SUCCINOIDES, sp. nov. (Plate LXXV. figs. 19, 20.)

Shell small, ovate, moderately solid, imperforate, pale greyish brown; whorls three, convex; suture deep; spire very small, scarcely exserted above the body-whorl; the latter very large, rather strongly striated by the oblique lines of growth; aperture ovately auriform, occupying about $\frac{8}{11}$ of the entire length of the shell; columella oblique, sinuated in the middle.

Length 5½ millims.; diam., with aperture, 4.

Hab. Lake Nyassa.

This little species is peculiar in its form, which reminds one of a small sinistral *Succinea*. The shortness of the spire, and the fewness of the volutions are the most prominent features.

19. PHYSOPSIS AFRICANA, Krauss.

Physopsis africaua, Krauss, Südafrik. Moll. p. 85, pl. v. f. 14; Küster, Conch. Cab. p. 72, pl. 12. f. 29, 30; Adams, Gen. Rec. Moll. iii. pl. 83. f. 10.

Physa africana, Krauss, Sowerby, Con. Icon. xix. pl. 1. f. 2*a–b*.

Hab. Port Natal (*Krauss*). Lake Nyassa (*Kirk*), teste Dohrn, P. Z. S. 1865, p. 233.

20. LIMNÆA NATALENSIS, Krauss.

Limnæa natalensis, Krauss, Südafrik. Moll. p. 85, pl. v. f. 15; Kuster's Con. Cat., No. 42, pl. 6, f. 1, 2, 3; Sowerby, Conch. Icon. xviii. pl. 7, f. 46*a–b*.

Hab. Natal (*Krauss*). Lake Nyassa (*Kirk*). Dohrn, *l. c.*

21. CYRENA ASTARTINA, Martens.

Cyrena astartina, Martens, Malak. Blätt. vi. (1859) p. 219, pl. 3. f. 6, 7; Prime, Cat. Corbiculidæ, American Journ. Conchol. v. no. 7 (*Corbicula*); Dohrn, P. Z. S. 1865, p. 234.

Hab. Tette, Zambezi River (*Martens*); Lake Nyassa (*Dohrn* and *Prime*).

22. CYRENA (CORBICULA) RADIATA, Parreyss.

Cyrena radiata, Parr. Philippi, Abbild. ii. p. 4, pl. i. f. 8.

C. africana, Krauss, part, Südafrik. Moll. p. 8.

Three specimens of this Nilotic species were obtained by Mr. Simons in the Lake. One of them is rather more inequilateral than normal examples, having the posterior end somewhat the longer. The concentric sulcation, too, in all three shells, is a little finer, and the violet rays somewhat obscure.

23. UNIO NYASSAËNSIS, Lea.

Unio nyassaënsis, Lea, Proc. Acad. Nat. Sci. Philad. 1864, p. 108; Journ. Acad. Nat. Sci. Philad. (1866), vol. vi. p. 33, pl. 12. f. 32.

U. nyassæ, Sowerby, Conch. Icon. sp. 224, f. 224, *a*, *b*.

U. nyassensis, Lea, Sowerb. *op. cit.* Errata and Index.

Var.=*U. kirkii*, Lea, *l. c.* p. 108; Journal, p. 32, pl. 12. f. 30.

Var.=*U. aferula*, Lea, *l. c.* p. 109; Journal, p. 34, pl. 13. f. 34.

Hab. Lake Nyassa (*Dr. Kirk*).

This species, like many others of this genus, is subject to considerable variation in form and sculpture. The three forms described by Lea are evidently nothing more than mere varieties of one and the same shell.

24. SPATHA ALATA, Lea.

Spatha alata, Lea, Proc. Acad. Nat. Sci. Philad. 1864, p. 109; Journ. Acad. Nat. Sci. (1866) vol. vi. p. 35, pl. 12. f. 31.

Hab. Lake Nyassa (*Dr. Kirk*).

25. SPATHA NYASSAËNSIS, Lea.

Spatha nyassaënsis, Lea, *l. c.* p. 109; Journal Acad. Nat. Sci. Philad. p. 36, pl. 13. f. 33.

Hab. Same as the preceding.

II. MARINE SPECIES.

1. BULLIA MOZAMBICENSIS, sp. nov. (Plate LXXV. fig. 18.)

Shell elongate, acuminately spired, more or less livid in colour; whorls nine, the two apical ones smooth and shining, the rest but slightly convex, separated by an oblique suture, sculptured with oblique, somewhat flexuous, fine and close-set plicæ, which extend from suture to suture in the upper whorls, and gradually become obsolete about the middle of the last volution; these riblets or plications, which are about equal in thickness to the spaces between them, give the upper margins of the whorls a finely crenulated appearance, and are subgranulous, through being intersected by spiral striæ, which gradually become wider apart as the shell increases; they are about nine in number on the penultimate whorl; the last is encircled by about 13; and the keel which winds around its base is of a brown colour, and the portion of the whorl below it whitish; mouth ovate-acuminate above, occupying a little more than $\frac{3}{5}$ of the entire length of the shell, olive-brown or purplish-brown margined with white within the labrum and at the base; labrum thickened, acute at the edge, and inconspicuously sinuated above; columella arcuate in the middle, thinly coated with a white enamel, which, extending above the lip and winding along the suture, gradually vanishes as it proceeds up the spire.

Length 32 millims.; diam. of last whorl 11; length of mouth $12\frac{1}{2}$, width nearly 6. Operculum unguiculate, concentrically and transversely striated.

Hab. Mouth of the Macusi River, Quilimane, E. Africa.

This species is remarkable for the subgranose plications on the whorls, and the brown carina of the body-whorl. It is difficult to describe in a few words the colour of this interesting form. The general appearance is livid, inclining to yellow or very pale olive; one shell is livid, with the upper margin of the whorls reddish. The callous band is quite conspicuous only about halfway around the body-whorl, and then gradually fades away, and is only noticeable further up the spire by slightly obliterating the lower extremities of the longitudinal ribs.

Two not quite adult specimens were collected by Dr. Kirk at the delta of the Zambesi River, and were placed in the British Museum by Earl Russell.

2. NATICA ANTONI, Philippi.

Natica antoni, Philippi, Zeitschrift für Malakozool. 1851, p. 48; Küster's Conch. Cab. p. 144, pl. 19. f. 18.

Hab. Mouth of the Macusi River, near Quilimane, E. Africa.

Nothing can be added to Philippi's excellent description of this interesting species; but I may mention that a young specimen has a distinct pale zone around the middle of the last whorl, between the two series of brown spots, which are more or less obsolete in the adult shell, and that its umbilicus is quite filled up with the callosity, even in the immature condition. The operculum is shelly, white exteriorly, except near the nucleus, where there is a small pale brownish callous deposit. The surface is smooth and shining, sculptured with the lines of growth, and a single distinct striation parallel with the outer edge, thus marking off a separate margin. From the nucleus a short ridge or rib extends itself towards the centre. The inner or under surface is clothed with a thin, pale yellow epidermis.

3. TELLINA OPALINA, Chemnitz.

Tellina opalina, Chemnitz, Küster's Conch. Cab. p. 172, pl. 35. f. 8.

Tellinides rosea, Sowerby, Gen. Rec. and Foss. Shells, f. 1.

Tellina planissima, Anton; Philippi, Abbild. i. pl. 2. f. 2; Thesaurus Conch. f. 197; Conchol. Icon. pl. 13. f. 58 *a*, *b*.

(Non *T. opalina*, Sowerby, Conch. Icon. sp. 258, f. 258 *a*, *b*.)

Hab. Mouth of the Macusi River, near Quilimane, E. Africa.

Only a single specimen, which apparently belongs to this species, was collected. It differs from the normal form in being rather more equilateral. It is pale rose-colour, almost white at the umbones, and at the ligamental area; and the internal raised radiating ribs are well defined. The name *opalina*, proposed by Sowerby for a species in the collection of Mr. Hanley, must be changed should it prove to be a well-defined species.

4. TIVELA DOLABELLA, Sowerby.

Cytherœa dolabella, Sowerby, Thesaurus Conch. iii. p. 619, pl. 127. f. 15; Reeve, Conch. Icon. xiv. sp. 2.

Hab. Mouth of the Macusi River, Quilimane, East Africa.

This species was originally described from a specimen in Cum-

ing's collection, said to have been from the Red Sea. The shell from Mozambique agrees perfectly with the type, except that the posterior end is rather less produced. I should add that the figure in the 'Conch. Icon.' considerably exaggerates the beaked appearance of this portion of the type shell. The lunule is elongate, narrow, and defined by a simple striation on each valve.

5. DONAX MADAGASCARIENSIS, Wood.

Donax madagascariensis, Wood, Index Testaceolog. Suppl. p. 5, pl. 2. f. 3; Sowerby, Thesaurus, iii. pl. 280. f. 16; Reeve, Conch. Icon. viii. sp. 50.

D. Keyii, A. Adams, P. Z. S. 1854, p. 87.

Hab. Macusi River, near Quilimane, East Africa.

The radiating striæ and the ridges between them are much more strongly developed on the posterior cordiform area than on the anterior surface. On the other hand the oblique ridges on the latter portion of the shell are much stronger than on the former, where they become thin lamellæ. The lines of growth are curiously present on the oblique costæ, near the anterior ventral margin of the valves, but not visible in the interstices between them.

6. DONAX ÆMULUS. (Plate LXXV. figs. 23–25.)

Shell small, triangular, somewhat elongate, very inequilateral, produced anteriorly, compressed and narrowly rounded, posterior area cordiform, not very acute at the margins, slightly sinuated at the middle; radiately striate, except for a narrow space at the anterior dorsal slope; the striæ are very fine, equidistant, those on the posterior area deeper and wider, with distinct intermediate lirulæ, which are decussated by still more prominent obliquely ascending ones, which do not pass beyond the rounded carina; umbones acute, but little incurved; interior dorsal slope rectilinearly sloping, posterior very suddenly inclined; ventral margin straightish; lunule linear; ligament small, prominent.

Colour yellow, purplish, or cinereous, generally varied with darker concentric bands and purplish radiating rays, most distinct within the valves, which are more or less purple, generally white at the crenulated margins.

Length 9½ millims., height 6, thickness 4.

Hab. Mouth of the Macusi River, near Quilimane.

This pretty species reminds one very much of the West-African *D. elongatus*. However, it is a trifle shorter, has not the rugose line on the posterior area, nor the flatness in the centre of that part.

EXPLANATION OF PLATES LXXIV. & LXXV.

PLATE LXXIV.

Fig. 1, 2. *Paludina jeffreysi*, p. 716.
3, 4. —— *capillata*, p. 717.
5, 6. —— *robertsoni*, p. 717.
Fig. 7. *Lanistes affinis*, p. 716.
8, 9. —— *nyassanus*, p. 715.
10, 11. —— *solidus*, p. 716.

PLATE LXXV.

Figs. 1, 2. *Melania nyassana*, p. 715.
3. —— *simonsi*, p. 713.
4–10. —— *polymorpha*, p. 714.
11, 12. —— *nodicincta*, p. 715.
13. —— *pupiformis*, p. 713.
14, 15. —— *turritispira*, p. 713.
Fig. 16, 17. *Physa nyassana*, p. 717.
18. *Bullia mozambicensis*, p. 719.
19, 20. *Physa succinoides*, p. 718.
21, 22. *Bythinia stanleyi*, p. 717.
23–25. *Donax æmulus*, p. 721.

7. On a new Species of Petrel from the Feejee Islands. By Dr. OTTO FINSCH, C.M.Z.S., Director of the Bremen Museum.

[Received July 2, 1877.]

PROCELLARIA ALBIGULARIS, sp. nov.

Head, quills, and tail sooty black; back, shoulders, and wing-coverts lighter, more of a sooty brown; the largest row of the upper wing-coverts at the tips washed with light brown, forming an ill-defined narrow cross band; the black of the head covers the sides and the chin-margin; below the latter is a semilunar white space, extending laterally to below the ear-region and bounded below by a very broad sooty black cross band, which commences at the junction of the wing; below this the remaining undersurface is white, as is the hind portion of the rump and upper tail-coverts; the longest under tail-coverts are sooty black, as are the under wing-coverts along the carpal and hind margins; the middle row of under wing-coverts white, as the axillaries; the greater under wing-coverts ashy, with white tips; the feathers of the sides of the vent and flanks with black shafts, forming very narrow dark striæ; tail-feathers on base of inner web white, passing into brown. Bill and feet black. Tail forked, its feathers very broad and truncated at the apex; the wings reach a little beyond the tail.

Long tot.	al.	rectr. intern.	rectr. extern.	culm.	tars.	tib.	dig. med.
9″	7″4‴	3″1‴	3″11‴	7‴	21‴	12‴	14‴

Hab. Feejee Islands, South Pacific.

The above description is taken from a female specimen from Kandavu, Feejee Islands, taken on the nest on the 10th of September, 1876, and sent over by Mr. Theodor Kleinschmidt to the Museum Godeffroy.

The large size, the deeply forked tail, and the singular coloration distinguish this species at once from any other member of this group.

8. Reports on the Collection of Birds made during the Voyage of H.M.S. 'Challenger.' No. IV. On the Birds of Tongatabu, the Fiji Islands, Api (New Hebrides), and Tahiti. By Dr. O. Finsch, C.M.Z.S.

[Received October 3, 1877.]

A. Birds of Tongatabu, Friendly Group.

These are 30 in number. They were collected on July 20, 21, and 22, 1874. Only nine species are represented in the series.

1. Collocalia spodiopygia, Peale.

Collocalia spodiopygia, F. & H. Ornith. Central-Polyn. p. 48; Layard, P. Z. S. 1876, p. 501 (Tonga); Finsch, Journ. Mus. Godeffr. Heft xii. 1876, p. 26.

Collocalia, sp.? F. & H. Journ. f. Orn. 1870, p. 125 (nest, Tonga).

No. 11. Tongatabu.

"These little Swallows were seen flying about in numbers on every part of the island at which we were. Shot July 20."—*J. M.*

Judging from the difference in the structure of the nests obtained by Dr. Gräffe from Tongatabu (*l. s. c.*) and those from the Fijis (Orn. Central-Polyn. p. 276, t. xiv.), I expected to find a different species of *Collocalia* inhabiting the Friendly group; but on examining the specimens before me, I find them exactly like those from the Fijis and Navigators'. The structure of the nests seems to vary individually. (Cf. Finsch, Journ. f. Ornith. 1872, p. 35, Upolu.)

Long. in. lin.	alæ. in. lin.	rectr. intern. lin.	rectr. ext. lin.	
	4 1	18	21	Tongatabu.
3 7	4 2	15–18	19–20	Fiji (6 specimens).
4 1–4 5		18–20	21–23	Navigators' (3 specimens).

Mr. Layard enumerates also *C. vanicorensis* among the birds of Tonga, although it was not detected by him. On this latter species compare Finsch, Journ. Mus. Godeff. Heft xii. 1876, p. 23. Its occurrence in the Fijis, which has been alleged by us (Orn. Central-Polyn. p. 47) upon the faith of a specimen sent us by Dr. Gräffe, the only one we saw said to be from thence, is very doubtful.

2. Halcyon sacra (Gm.).

Halcyon sacra, F. & H. Ornith. Central-Polyn. p. 32; P. Z. S. 1869, p. 545 (Tonga); Journ. f. Orn. 1870, p. 1241 (Tonga); Layard, P. Z. S. 1876, p. 501.

No. 2. Tongatabu. Male.
3. „ Male.
4. „ Female.
5. „ Female.

"Shot July 20; eyes black. These birds were in considerable numbers near the houses of the natives."—*J. M.*

No. 23. Tongatabu. Female.
24. „ Male.
27. „ Female.
28. „ Male.

"Shot July 21."

No. 27 (female) has a pure white superciliary stripe; in the other specimens this is washed more or less with cinnamon-rusty, very strongly and broadly in No. 4 (female). Nos. 2, 3, and 4 show narrow rusty margins to the upper wing-coverts, which seem not peculiar to the young birds. That both sexes are precisely alike, I can state from dissection of specimens in alcohol. Generally Tonga specimens show a more greenish tinge on the back; but in some specimens (as 5, male, 23, female, and 24, male) the blue is as dark and pronounced as in Fiji specimens, and in some of the latter (as 95, male and 61, male) as greenish as in Tonga specimens. The under wing-coverts and sides in the Tonga bird are mostly pure white; but Nos. 3 and 4 show a rusty tinge.

3. PTILOTIS CARUNCULATA (Gm.).

Ptilotis carunculata, F. & H. Ornith. Central-Polyn. p. 58; P. Z. S. 1869, p. 545 (Tonga); Journ. f. Orn. 1870, p. 125 (Tonga); Gräffe, ib. p. 404 (habits); Layard, P. Z. S. 1876, p. 501 (Tonga).

No. 12. Tongatabu. Male.
13. „ Male.
14. „ Female.
15. „ Female.

"Shot July 20. These are the most abundant birds on the island. They have a very clear bell-like note. Eyes black; wattle yellow."—*J. M.*

4. LALAGE MACULOSA (Peale).

Colluricincla maculosa, Peale, U.S. Expl. Exped. 1st edit. (1848), p. 81, pl. 23. f. 10.

Lalage terat, Cass. (nec Bodd.), ibid. 2nd edit. (1858), p. 143; F. & H. Ornith. Central-Polyn. p. 80; P. Z. S. 1869, p. 546 (Tonga); Journ. f. Orn. 1870, p. 149 (Tonga); Finsch, ibid. 1872, p. 41 (Samoa); Layard, P. Z. S. 1875, p. 433 (Fiji), 1876, p. 494 (Navigators') and p. 502 (Tonga).

Campephaga maculosa, Gray, Hand-l. i. p. 339. no. 5124.

No. 16. Tongatabu. Male.
17. „ Male.

"Eyes white. Common on the island; shot July 20."

No. 29. Tongatabu. Female. "Shot July 21."
32. „ Male.

	Long. alæ.		caud.		rostr. a front.		latit. rostr.	tars.	
	in.	lin.	in.	lin.	in.	lin.	lin.	lin.	lin.	
No. 16.	3	6	2	4	6		4	11½		
17.	3	7	2	4	5		3½	11½		
29.	3	6	2	4	6		3¼	11		
32.	3	8	2	5	5½		3½	11		
49.	3	6	2	4	6		3¼	11		
50.	3	5½	2	6	c. 6		3	10		
113.	3	3	2	2	5½		3	10		
	3	1–3	5	2	0–2	2	5½–6	—	9½–10	Fiji (4 specimens).
	3	2–3	7	2	0–2	6	6	—	10 –11½	Upolu (5 „).
	3	6–3	9	2	3–2	5	6 –6½	—	10 –12	Tonga (9 „).
		3	4		2	5	5½	—	9½	*L. terat.* Java.

Among the specimens before me Nos. 17, 32, and 49 (Fiji) are adult and fully coloured, which are very rare in collections, and give me a good opportunity of making a close comparison of them with Javan specimens of the true *Lalage terat* (Bodd.), with which the Central-Polynesian bird has hitherto been confounded. I have myself stated (J. f. Orn. 1872, p. 130) their undoubted identity; but having then seen only young and a few old specimens in bad condition, I was misled. The series before me seems to confirm the views of Mr. G. R. Gray, who keeps the Polynesian bird separate.

The latter may be distinguished from *L. terat* by the grey or brownish-grey rump and upper tail-coverts being always barred by irregular but distinct cross lines, the rump being of a uniform grey with faint darker traces in *L. terat*—by the black shaft-stripe on the white middle row of the upper wing-coverts, which is wanting in *L. terat*—and by the narrow brownish external margin of the primaries and first secondaries, which in the old *L. terat* are white. The latter besides shows a distinct greyish tinge on the breast and sides, whereas in *L. maculosa* the whole undersurface is pure white. The young bird, although much more like *L. terat*, may be distinguished by the much broader cross bands on the sides of the under-surface and on the rump.

The distribution of *L. maculosa* seems confined to the Central-Polynesian Islands, Fiji, Tonga, and the Navigators'.

5. Aplonis tabuensis (Gm.).

A. marginata, Gould, P. Z. S. 1836, p. 73.

No. 8. Tongatabu. Male.
9. „ Female.
25. „ Male.

"Shot July 20 and 21. Eyes dark red."—*J. M.*

6. Ptilinopus porphyraceus (Forst.).

Ptilinopus porphyraceus, F. & H. Orn. Central-Polyn. p. 119; P. Z. S. 1869, p. 547 (Tonga); Journ. f. Orn. 1870, p. 131 (Tonga); Layard, P. Z. S. 1876, p. 502 (Tonga).

No. 6. Tongatabu. Male. "Eyes yellow."
7. „ Male.

"Shot July 21 and 22. These birds were very shy; though we heard them frequently, it was very difficult to get a shot at them." —*J. M.*

Of this species, which is peculiar to the Friendly group, a full description and characters of distinction from the Fijian and Navigators' *Pt. fasciatus* are given as cited above.

7. CARPOPHAGA PACIFICA (Gm.).

Carpophaga pacifica, F. & H. Orn. Central-Polyn. p. 142; Journ. f. Ornith. 1870, p. 134 (Tonga); Layard, P. Z. S. 1875, p. 503 (Tonga).

No. 18. Tongatabu. Male. Shot July 21.

"This large pigeon 'coos' very like our pigeon at home. It appears to be common but shy. Eyes red."—*J. M.*

No. 26. Tongatabu. Male. "Eyes red."

31. „ Female.

79. Samoa. Female.

"Eyes and legs red. Presented alive by the Rev. George Brown."

The sexes are alike in plumage; but the female is without the knob on the base of the bill, and exactly agrees with specimens from the Navigators' and the Fijis; the vinaceous tinge in the male birds seems to be more strongly developed during time of incubation.

In our 'Ornithology of Central Polynesia,' Dr. Hartlaub and I erroneously united *C. oceanica*, Less., with this species; but since then we have shown (P. Z. S. 1872, p. 101, and Journ. Mus. Godeffr. Heft viii. 1875, p. 26) that the latter is a distinct species, occurring in the islands of the Western Pacific. *C. pacifica* is confined to the Central-Polynesian Islands.

8. ARDEA SACRA, Gm.

Ardea sacra, F. & H. Ornith. Central-Polyn. p. 201, Journ. f. Orn. 1870, p. 136 (Tonga); Layard, P. Z. S. 1875, p. 503 (Tonga).

No. 19. Tongatabu. Female. "Eyes yellow."

20. „ Female, young.

"Common on the reefs at low water; also met with in the woods through the island. Shot July 21."—*J. M.*

No. 22. Tongatabu. Male. Shot July 22.

No. 19 is white, assuming the slate-coloured dress from below and on the back; slate-blue appanage in full development.

No. 20. Slate-blue, with white chin-stripe; the scapular appanage in beginning of development.

No. 22. White, sprinkled on the neck, back, and below with single slate-blue feathers; no development of scapular appanage visible.

On several occasions I have shown that the white dress in this Heron is not dependent upon age or sex, and that at present we are not able to explain the causes of these interesting differences in coloration satisfactorily.

9. PORPHYRIO SAMOËNSIS, Peale.

P. samoënsis et *P. vitiensis*, Peale.

P. vitiensis, F. & H. Ornith. Central-Polyn. p. 172, t. xii. f. 3.

P. indicus, Cass. (nec. Hors., nec F. & H.).

P. vitiensis, F. & H., Journ. f. Orn. 1870, p. 135 (Tonga); H. & F., P. Z. S. 1871, p. 27 (Savai).

P. samoënsis, F., Journ. f. Orn. 1872, p. 55.

P. vitiensis, Layard, P. Z. S. 1875, p. 439 (Fiji); ibid. 1876, p. 497 (Navigators'), and 1876, p. 503 (Tonga).

P. indicus, Whitmee (nec Horsf.), Ibis 1875, p. 446 (Samoa).

No. 21. Tongatabu. Female. "Eyes red; the only specimen seen; shot July 22."—*J. M.*

Long. alæ. in. lin.	caud. in.	rostr. a rict. lin.	rostr. scut. incl. in. lin.	latit. scut. lin.	long. tars. in. lin.	tib. lin.	dig. med. in. lin.
8 6	3	16½	2 3	9	2 10	15	2 9

I have already explained (P. Z. S. 1871, p. 27) that *P. indicus*, Horsf., does not occur in Polynesia, as has been stated by Mr. Cassin, but that the Central-Polynesian Islands (Fiji, Navigators' and Friendly group) possess only one species; *P. samoënsis*, Peale. The description in the 'Ornithology of Central Polynesia' (p. 170) taken from a Javan specimen of the true *P. indicus*, Horsf., must therefore be cancelled altogether.

Specimens from the Fijis and Tonga group look apparently somewhat larger than those from the Navigators'; but on comparing the series of measurements given, it will be easy to see that in respect to size no specific distinction can be made out. In coloration there is also no difference.

B. Birds of the Fiji Islands.

These birds were shot on the island of Matuka on July 24, 1874, on the island of Kandavu on July 25 and from August 3 to 6, 1874, and on the island of Levuka from July 28 to August 1, 1874. They are 82 in number and represent 25 species.

1. Astur rufitorques, Peale.

Nisus cruentus, Schleg. (nec Gould), Mus. P.-B. Astures, p. 40.

Astur cruentus, F. & H. (nec Gould), Ornith. Central-Polyn. pp. 3 and 273; Layard, P. Z. S. 1875, p. 424.

A. rufitorques, Sharpe, Cat. Brit. Mus. i. p. 121.

Nisus rufitorques, Schleg. Mus. P.-B. Accip., Revue, p. 80 (1873).

No. 34. Matuka. Female. "Eyes brown; several of these were seen, only two shot."

No. 35. Matuka. Female.

36. „ Male. "Eyes yellow."

62. Kandavu. Female. "Eyes yellow; shot July 27."

80. „ Female. "Eyes yellow, cere yellow, legs yellow; the stomach contained a portion of a lizard. Shot Aug. 5."

	Long. alæ. in. lin.	caud. in. lin.	rostr. a cer. lin.	tars. in. lin.	dig. med. lin.	
No. 34.	8 9	6 0	8	2 3	17	
35.	8 6	6 2	8	2 3	17	
36.	7 3	5 2	7	1 11	13	
62.	8 10	6 4	8½	2 1	16	
80.	8 9	5 10	9	2 1	16	
	8 9	6 2	...	2 1	16	♀ jun. Ovalau.
	7 3	5 0	7	2 0	13½	♂ Viti Levu.
	8 2	6 0	8	2 1	15	♂ Ternate.
	10 2	8 0	...	...	...	♀ „
	8 6	6 9	8½	2 3	16	jun. Halmahera.

In our 'Ornithology of Central Polynesia' we followed Professor Schlegel in uniting the Hawk of the Fijis with *Astur cruentus* of Australia; but, as on some other occasions, we depended too much on Prof. Schlegel's authority, and Prof. Schlegel has since declared himself to have been in error. Not having access to specimens, I cannot myself judge of the correctness of Prof. Schlegel's new view; but the fine series now before me inclines me to believe that *A. rufitorques* is most probably peculiar to the Fiji group, and not the same species as is distributed widely in the Malay archipelago and usually known as *A. griseigularis* and *A. henicogrammus*, Gray (= *A. æquatorialis*, Wall.).

In coloration the Fiji specimens are pretty constant, all showing above a beautiful ashy-blue, beneath a fine vinaceous rufous, which latter forms also a broad neck-collar. This is less developed in No. 35, and looks rather imperfect. The under-surface in No. 62 shows a nearly obsolete undulation of narrow darker lines on the ventral region; the under wing-coverts in all the specimens before me are not "uniform white" as noted in his specific diagnosis by Mr. Sharpe (*l. c.* p. 95); but the white is washed with delicate pale vinaceous, which shows in Nos. 34 and 80 faint darker undulations. An old specimen of *A. griseigularis* is generally conspicuously darker, slaty-brownish on the back, wings, and tail, the underparts also dark vinaceous-rufous with perceptible narrow light cross bands (agreeing exactly with figs. 3, 4, taf. 14, in Schleg. 'Vog. van Nederl. Indië'). A young bird of *A. griseigularis* hardly shows any difference from our young male (No. 36), except that the lores, cheeks, and a median stripe on the chin are decidedly ashy.

2. PLATYCERCUS SPLENDENS, Peale.

Platycercus splendens, Finsch, Mon. Papag. ii. p. 237; Layard, P. Z. S. 1875, p. 425; Ibis, 1876, p. 143 (first race only).

No. 52. Kandavu. Male. "Eyes red."
53. „ „ „
63. „ „ „
112. „ „ "Eyes orange, feet and bill black."
64. „ Female. "Eyes yellow."

All the specimens agree among themselves; all show a blue neck-collar, but which differs in extent, in one (No. 112) being interrupted

by green; none of them have red spots on the rump, such as are sometimes shown in *P. tabuensis*. The size varies a good deal; wings 8″ to 8″ 8‴.

Mr. Layard (Ibis, 1876, p. 141) points out the characters of four different races of this Parrot occurring in the Fijis:—

(1) the bright crimson-bellied race, with broad blue collar, from Viti-Levu and Kandavu, being the true *Platycercus splendens*, Peale;

(2) the Mathuata race, "maroon-bellied," with broad blue nuchal collar;

(3) the Koro race, maroon-bellied with the faintest trace of the blue collar; and

(4) the Taviuni race (*P. taviunensis*, Layard), "maroon-coloured and without a trace of the blue collar."

Of these I have before me only one specimen from Taviuni, which, indeed, differs strongly from *P. splendens*. It has the same dark maroon-purplish coloration as *P. tabuensis*, and wants the blue neck-collar; besides it is considerably smaller (wings 7″ 8‴). As I have become convinced by a large series of *A. tabuensis* that in this species the blue collar is also sometimes almost wanting, I think this cannot form a specific character, even less than the purplish-red spots on the rump, which vary individually. If the smaller size should turn out to be constant, this dark form ought to be separated from the nearest-allied *A. tabuensis* under the name of *A. annæ*, Bourj. (*P. taviunensis*, Layard).

3. Platycercus personatus, G. R. Gray.

Platycercus personatus, Finsch, Mon. Pap. ii. p. 239; Layard, P. Z. S. 1875, p. 425.

No. 78. Levuka. Female. "Eyes orange, with streaks of red; bill and legs black. This bird was purchased alive."

4. Domicella solitaria (Gm.).

Domicella solitaria, Finsch, Mon. Papag. ii. p. 760.

Lorius solitarius, F. & H. Orn. Central-Polyn. p. 23; Layard, P. Z. S. 1875, p. 426.

No. 37. Matuka. Female.
38. „ Female.
39. „ Female.
40. „ Male.

"These birds were not common, although when they were seen a good number were in company. Eyes red and yellow."

No. 89. Kandavu. Male. "Eyes red; bill and legs yellow; stomach contained fruit."

No. 99. Kandavu. Female. "Shot August 6."
100. „ Male „ „

5. Cuculus simus, Peale.

Cuculus simus, F. & H. Ornith. Central-Polyn. p. 28; Layard, P. Z. S. 1875, p. 426.

No. 90. Kandavu. "Upper mandible and margin of lower black,

base of the under flesh-colour or reddish; eyes dull orange; feet yellow; stomach contained parts of beetles and caterpillars. Shot August 6."—*J. M.*

Long. alæ. in. lin.	rectr. intern. in. lin.	rectr. ext. in. lin.	rostr. a front. lin.	latit. rostr. lin.	tars. lin.	
4 7	4 6	3 0	7	4	$8\frac{1}{2}$	No. 90.
4 8	4 6	2 9	8	$4\frac{1}{2}$	—	♂, Taviuni.
4 7	4 10	2 4	$7\frac{1}{2}$	4	8	Fiji.
5 2	4 11	3 10	$8\frac{1}{2}$	3	(*C. bronzinus*).	

As this Cuckoo is only a migratory visitor to the Fiji group, it would be of interest to ascertain whither it resorts after leaving the islands, which at present are the only locality known for the species. Prof. Schlegel seems wrong in uniting it with the Australian *C. flabelliformis*, Lath., which seems to be a rather larger bird, as is also *C. bronzinus*, Gray, of New Caledonia, which otherwise agrees nearly in coloration. Mr. Gould has since described a Cuckoo (*Cacomantis castaneiventris*, B. of Austr. Suppl. Part iv. 1867) from Queensland, which, judging from the plate (apparently a little exaggerated in colour), comes very near to *C. simus*, but is smaller (wings 4″ 2‴).

Our *C. infuscatus* (Orn. Central-Polyn. p. 31, t. v. f. 1), corresponding in size exactly with *C. simus*, will probably turn out to be a melanistic phase of the latter.

6. Hirundo tahitica, Gm.

Hirundo tahitica, F. & H. Ornith. Central-Polyn. p. 51; Layard, P. Z. S. 1875, p. 430.

H. subfusca, Gould.

No. 45. Matuka. Female.
46. „ Female.

"Eyes black."

No. 104. Kandavu. Female. "Eyes, bill, and legs black; stomach contained insects."—*J. M.*

This short-tailed Swallow comes nearest to *H. javanica*, Sparrm. (*H. domicola*, Jerd.), but has a rather broader bill; the underparts below the ferruginous throat-portion are darker brownish; and the tail-feathers want the white spot on the inner web. I must mention, however, that in No. 45 the second right-hand tail-feather shows a very small pale spot on the inner web. The sexes are alike.

7. Collocalia spodiopygia, Peale.

Collocalia spodiopygia, Layard, P. Z. S. 1875, p. 428 (Fiji; habits).

No. 93. Kandavu. Female.
94. „ Male.

"Eyes, feet, and bill black; stomach contained parts of insects. Shot August 6."

The Fiji specimens look a little lighter from below than those from Tonga and the Navigators'.

8. HALCYON SACRA (Gm.).

Todirhamphus vitiensis, Cass.
Halcyon cassini, F. & H. Orn. Central-Polyn. p. 40.
H. sacra and *H. cassini*, Layard, P. Z. S. 1875, p. 427.

No. 61. Kandavu. Male. "Eyes and bill black."
95. „ Male. "Eyes black, feet greyish; upper mandible black and margin of the under, rest of lower mandible pale red. Stomach contained a wasp and parts of other insects. Shot August 6."—*J. M.*
No. 109. Kandavu. Male.
110. „ Male.

The Fiji specimens are generally darker and of a more brilliant blue, the neck-collar is washed with rufous, as are the sides of the vent and flanks, which in the Tonga birds are, like the neck-collar, almost pure white. But these differences are in certain specimens so indistinct that thereupon no specific characters can be based. *H. cassini*, Finsch & Hartl., with an ill-defined superciliary stripe, rests on individual differences which are of no specific value. But I may remark that among a very large number of specimens examined by me from the Friendly and Fiji Islands, I never met with one having a white head showing only a blue vertical spot, as is represented in the right-hand figure of Sharpe's plate of *H. sacra*, which I think must still be kept separate as *H. peali*, F. & H., from the Navigators'. In size the Fiji specimens are exactly the same as those from Tonga, and have not a longer bill, as has been stated by Mr. Layard (P. Z. S. 1876, p. 501).

9. MYZOMELA JUGULARIS, Peale.

Myzomela jugularis, F. & H. Orn. Central-Polyn. p. 54, t. vii. f. 1, 2; Layard, P. Z. S. 1875, p. 431.

No. 43. Matuka. Male.
44. „ Female.

"Eyes black. These little birds were flying in considerable numbers about a large tree covered with red blossom; only a few, however, were brought on board."—*J. M.*

No. 59. Kandavu. Male. "Eyes and legs black."
60. „ Female.
85. „ Male.
86. „ Female.

"Eyes and bill black; legs a bluish tinge with soles yellow. Stomach contained portions of insects. Shot August 5."
No. 70. Kandavu. Male.

In the female (No. 60) the red on the vertex or chin is more restricted; on the rump it is wanting in all; in No. 60 also on the vertex. No. 86 shows some red feathers on the rump but none on the vertex.

10. PTILOTIS CARUNCULATA (Gm.).

Ptilotis carunculata, Layard, P. Z. S. 1875, p. 432.

No. 47. Matuka. Male.
48. „ Female.

"These birds (the same as Nos. 12, 13, 14 and 15 from Tongatabu) did not appear so common as in Tongatabu, and seem to be rather smaller."—*J. M.*

alæ. in.	lin.	caud. in.	lin.	rostr. a front. lin.	
3	3	2	8	$7\frac{1}{2}$	♂ No. 47.
3	3	2	5	7	♀ 48.

On comparing the measurements above given with those of the Tongatabu specimens, Mr. Murray's opinion as to the smaller size of the Fiji birds seems to be confirmed; but a reference to the table of measurements published by me (Journ. f. Orn. 1870, p. 126), taken from 29 specimens from the Navigators' and Tonga groups (those of the latter series having been sent over in spirits and mostly dissected by myself), will show all gradations of size, and the impossibility of separating the Fiji bird on account of its smaller size. In coloration specimens from the Fijis, Tonga, and Navigators' are precisely alike.

The occurrence of the true *Pt. carunculata* on the Fijis (doubted by me, Journ. f. Orn. 1872, p. 36) has been already established by Mr. Layard. According to this gentleman the species is confined to the island of Loma Loma. He endeavours also to introduce a new species (*Pt. similis*), said to be peculiar to the island of Vanua Levu; but the short diagnosis (Ibis, 1876, p. 148), "having pale yellowish grey ear-tufts instead of bright golden yellow," seems to me insufficient to distinguish it. Perhaps it will turn out to be *P. procerior*.

Mr. Layard also remarks that in our 'Ornithology of Central Polynesia' we wrongly describe the iris to be white, as it is in fact brown or ashy-brown. As we never had an opportuity of seeing the bird alive, we could follow only the notice of Dr. Gräffe, who gave the iris as "white;" but we also noticed "brown" (Peale), "ashy-grey" (Latham), and "blue-black" (Forster).

11. PTILOTIS PROCERIOR, F. & H.

Ptilotis procerior, Orn. Central-Polyn. p. 62, t. v. f. 3; Layard, P. Z. S. 1875, p. 431.

Nos. 73 and 74. Male. Levuka.

This species is well distinguished from the former (*P. carunculata*) by having no true wattle, but a naked space below the ear-region, surrounded by a blackish line, and by the absence of the yellow moustache, which is always visible in *P. carunculata*.

Through the Museum Godeffroy I have received many specimens for inspection from the following localities:—Ovalau, Vatu Lele, Vanua Levu, and Lavu-savu.

Young birds are of a sombre olive, without the yellowish tinge on

the throat and breast. The size is also very variable, as is shown by the following table of measurements :—

	Long. al.	caud.	rostr. a front.		
	m. lin.	in. lin.	lin.		
	3 9	3 0	$10\frac{1}{2}$		Ovalau. Type of *P. procerior*.
	3 10	2 11	$9\frac{1}{2}$		„
No. 74.	3 5	2 8	10	♂	„ (Levuka). 'Challenger,'
73.	3 6	2 11	9	♂	„ „ „
	3 10	—	10	♂	Vatu Lele. Mus. Godeffr.
	3 4	2 7	$8\frac{1}{4}$	♂	„ „
	3 8	2 11	$8\frac{3}{4}$	♂	Vanua Levu. „
	3 3	2 7	$8\frac{1}{2}$		Viti. „
	3 1	2 6	$7\frac{3}{4}$	♀	Vanua Levu. „
	2 10	—	c. 8	♀	Savu-savu. „
	2 11	—	8	♀	Viti. „

Valuable notices on the habits of this species as observed by Mr. Th. Kleinschmidt, are published in the Journ. Mus. Godeffr. Heft xii. 1876, p. 13.

12. PTILOTIS PROVOCATOR, Layard.

Ptilotis provocator, Layard, P. Z. S. 1875, p. 28.

P. xanthophrys, Finsch, Journ. Mus. Godeffr. Heft xii. 1876, p. 5.

No. 65. Kandavu. Male. "Eyes brown." July 25.
66. „ Female.
67. „ Male.
68. „ Male.
83. „ Male.
84. „ Female.

"Eyes brown; legs a greenish tinge; bill black. Stomach contained ants, spiders, grasshoppers."

No. 106. Kandavu. Female. Shot August 6.
111. „ Male. "Eyes brown; bill black; legs a greenish tinge."

The specimen I described as *P. xanthophrys* was labelled "Navigators';" but this was a mistake, as this bird, which must bear Mr. Layard's previous name, is confined to the Fijis.

This is a well-marked, excellent species, always characterized by the yellow patch surrounding the eye, extending to the ear-region. Even the young bird (No. 84) shows this character, but differs otherwise in being underneath strongly tinged with olive-yellow, showing no whitish shafts, which form such conspicuous striæ even on the back of the old birds. The sexes are alike. The size, as usual in this genus, varies considerably individually.

13. ZOSTEROPS FLAVICEPS, Peale.

Zosterops flaviceps, F. & H. Orn. Central-Polyn. p. 52, t. vi.; Layard, P. Z. S. 1875, p. 430.

No. 71. Levuka. Female.
72. „ Male. "Eyes black."

In coloration this species is so like *Z. westernensis* (Quoy & Gaim.) of Australia, that Dr. Hartlaub and Mr. Gould could find only in the somewhat stronger bill a ground of distinction; but as the specimens now before me show only a difference of half a millimetre, this character can no longer stand. However, I now observe that the Fiji bird has the under tail-coverts of a deeper yellowish; so that I think *Z. flaviceps* may be kept separate until more specimens show this difference also to be of no constant value.

14. Zosterops explorator, Layard.

Zosterops explorator, Layard, P. Z. S. 1875, p. 431.

No. 57. Kandavu. Female.

58. „ „ "Eyes black."

The discovery of this species is due to Mr. John Murray, of the 'Challenger' Expedition. As Mr. Layard has published only a short diagnosis, I think a full description will be necessary—the more so as the specimens now before me are the types.

Upper surface yellow olive-green, more yellow on the top and sides of the head and neck, changing into pure citron-yellow on the lores; chin, throat, and breast the same as the under tail-coverts; lower part of breast and remaining under surface yellowish white; flanks distinctly washed with pale brownish grey; under wing-coverts white; wing- and tail-feathers brown-black, narrowly margined externally with olive-green; remiges margined on their inner webs with white; there seems to be a narrow white eye-ring, surrounded by a narrower blackish one; bill blackish, lower mandible pale at base; legs plumbeous.

Long. tot.	al.		caud.	rostr.	tars.
in.	in.	lin.	lin.	lin.	lin.
c. 4	2	$2\frac{1}{2}$	16	5	$7\frac{1}{2}$

Both specimens are precisely alike.

This species comes nearest to *Z. xanthochroa*, Gray, from New Caledonia; but the olive-green of the upper parts inclines decidedly to yellow, and the yellow on the throat and breast is purer and brighter.

15. Monarcha lessoni (Quoy & Gaim.).

Monarcha lessoni, F. & H. Orn. Central-Polyn. p. 88, t. vii. f. 5; Layard, P. Z. S. 1875, p. 434.

No. 87. Kandavu. Male. "Bill light blue, darker at the base; legs bluish; eyes black. Stomach was crammed with broken parts of insects."—*J. M.*

No. 103. Kandavu. Male. Shot August 6.

116. „

16. Myiagra castaneiventris (J. Verr.)

Myiagra castaneiventris, F. & H. Orn. Central-Polyn. p. 95, taf. ix. f. 2, 3; Layard, P. Z. S. 1875, p. 435.

No. 51. Matuka. Male. "Eyes black. Frequents chiefly the mangrove trees."

No. 75. Levuka. Male. "Eyes black." Shot July 30.
76. „ „
101. Kandavu. Male. Shot August 6.
102. „ Female. „
114. „ „
115. „ Male.

I am surprised to find the specimen No. 101 marked "male;" for it agrees with No. 114, marked "female," whereas the female, No. 102, shows the very different plumage of the black-throated males. If these statements are based on dissection, they would tend to prove a uniformity of both sexes—a fact very strange, and opposite to all we know at present of the members of this genus.

This species is confined to the Fijis, and does not occur on the Navigators', as stated wrongly in our 'Polynesian Ornithology.' The specimens described by us from Samoa were wrongly labelled. The representative species in the latter islands is *M. albiventris*, Peale (= *M. rufiventris*, Elliot, Ibis, 1859, p. 393).

17. PACHYCEPHALA VITIENSIS, Gray.

Pachycephala vitiensis, Layard, P. Z. S. 1875, p. 433, et Ibis, 1876, p. 154.

No. 69. Kandavu. Female. "Eyes red." July 24.
82. „ „ "Eyes hazel; legs a bluish tinge; bill brown. Shot August 5."

Without having male specimens also on hand it is not possible to determine these specimens satisfactorily, as there has arisen a great confusion since Mr. Layard pointed out the existence of 5 or 6 species in the Fijis. As the specimens are collected in Kandavu they ought to be "*P. vitiensis*," which, according to Mr. Layard, is confined to this island; and, judging from Mr. Gray's short description, they would belong to this species. But I may mention that the female specimen described and figured by us s. n. *P. vitiensis* (Orn. Central-Polyn. p. 73, t. viii. f. 3), apparently belongs to the species described since as *P. torquata*, Layard (P. Z. S. 1875, p. 433).

18. LALAGE MACULOSA (Peale).

No. 49. Matuka. Female.
50. „ „
113. Kandavu. Male. "Eyes hazel; bill blackish; legs a greenish tinge."

On this species see above, p. 724.

19. APLONIS VITIENSIS, Layard.

Aplonis vitiensis, Layard, P. Z. S. 1876. p. 502.
A. tabuensis, F. & Hartl. (nec Gm.), Ornithol. Central-Polyn. p. 103, t. x. f. 2.

No. 41. Matuka. Male.
42. „ Female.

"Eyes dark red or brown. This is the same bird as Nos. 8, 9,

25 (i. e. *A. tabuensis*), from Tongatabu, and appeared to be not at all common: only two specimens were obtained. These seem smaller, and altogether a variety when compared with those from Tongatabu."—*J. M.*

The distinctive characters of this species (which, following Peale, we formerly erroneously described as the true *A. tabuensis*) I have explained in my paper on the birds of Eua (see below).

	Long. al. in. lin.	caud. in. lin.	rost. a front. lin.	
No. 41.	3 8	2 1	7	*A. vitiensis.*
42.	3 5	2 0	6½	
8.	4 0	2 3	8	*A. tabuensis.*
25.	4 3	2 6	7	,,
9.	4 1	2 5	7½	,,

The comparison of the dimensions between the Fiji and Tonga specimens, given above, will show a considerable difference: but I must remark that they cannot stand as of specific value; for I have measured specimens from Tonga as small as those from Fiji, and also large specimens from Fiji.

20. CHRYSŒNA VICTOR, Gould.

Chrysœna victor, Finsch, P. Z. S. 1873, p. 733, et 1875, 557; id. Journ. Museum Godeffroy, Heft xii. (1876) p. 10; Layard, P. Z. S. 1875, p. 437.

An old specimen in full plumage from Taviuni.

21. CHRYSŒNA VIRIDIS, Layard.

Chrysœna viridis, P. Z. S. 1875, pp. 151 et 437.

No. 55. Kandavu. "Sex not certain. Eyes yellow; legs violet; bill green."

No. 56. Kandavu.

No. 81. Kandavu. "Male. Bill green; legs violet; eyes white. Stomach contained green fruit with stones."

No. 91. Kandavu. "Male. Eyes white; bill green; legs violet."

No. 92. Kandavu. "Male. Stomach contained a fruit about the size of a cherry, with a large hard stone. Shot August 6."—*J. M.*

This well-marked species, distinguished by the yellow head and under tail-coverts, is not the young of *C. luteovirens*, as erroneously supposed by me (Journ. Mus. Godeffr. Heft xii. p. 10). It seems to be confined to the island of Kandavu, and was first discovered, as Mr. Layard notices, by the 'Challenger' Expedition.

22. COLUMBA VITIENSIS, Quoy & Gaimard.

Columba vitiensis, F. & H. Ornith. Central-Polyn. p. 137, t. xi. f. 2; Layard, P. Z. S. 1875, p. 437, et 1876, p. 496.

No. 54. Male. Kandavu. "Eyes yellow; legs and upper part reddish, and beak, except tip, red."

No. 97. Male. Kandavu. "Legs and eyes red, eyelid red; bill, base red, tip green. The stomach contained the seeds of the

little red pepper so common on shore (chili). The gizzard was quite ordinary, and contained nothing of the nature of that in Nos. 88, 96 (*Carpophaga latrans*). The first specimen we have taken of this pigeon. Shot August 6."

No. 107. Male. Kandavu.

This pigeon seems also peculiar to the Viti group, although assigned in our book and by Mr. Layard also to the Navigators' Islands. On the specific distinctness of the representative form in the latter group (*C. castaneiceps*, Peale), conf. Finsch, Journ. f. Ornith. 1872, p. 47.

23. CARPOPHAGA LATRANS, Peale.

Carpophaga latrans, F. & H. Ornith. Central-Polyn. p. 140; Layard, P. Z. S. 1875, p. 438.

No. 88. Kandavu. Female. "Cere and eyes red; legs red or purplish; bill black. The stomach contained the fruit of some tree unknown to me[1]. The coat of the stomach had hard pupilla-like ossifications of a circular form, in two or three rows. These indurations are composed of a horny substance. Shot August 5."

No. 96. Kandavu. Female. "Eyes red; bill black; cere red; legs purple. Stomach contained a large green fruit. Same as No. 88. Shot August 6."—*J. M.*

These examples agree with specimens from Viti-Levu. The species is peculiar to the Fiji group, and, according to Mr. Layard, is found on nearly all of the islands.

24. ARDEA SACRA, Gm.

Ardea sacra, Layard, P. Z. S. 1875, p. 440 (Fiji).

No. 33. Matuka. Female. July 24.

A uniform slate-coloured specimen, with white chin-stripe.

25. ANAS SUPERCILIOSA, Gm.

Anas superciliosa, F. & H. Orn. Central-Polyn. p. 213; Layard, P. Z. S. 1875, p. 440.

A. pelewensis, H. & F. Journ. Mus. Godeffr. Heft viii. 1875, p. 40.

No. 98. Kandavu. Male. "Eyes dull pink; bill black; legs flesh-colour with a salmon tinge. Stomach contained worms and mud. Shot August 6."—*J. M.*

No. 108. Kandavu. Male.

	Long. al.	caud.	rostr. a front.	Altit. rostr.	Latit. rostr.	Long. tarsi.	dig. med.
	in. lin.	in. lin.	lin.	lin.	lin.	lin.	lin.
No. 108. Fiji	8 10	2 7	19½	7½	8½	17	20
98. Fiji	8 6	—	19	8	8½	17	21
Tonga.....	8 9	—	19	9	9	17	21
Navigators'..	8 3	2 7	23	—	—	18	21
Pelew.....7 8–8	6 2	6–3 0	17–19½	6½–7	8–8½	14–17	18–20 (7 spec.)
New Zealand 9 0–9	6 3	1–3 4	20½–22	8 –8½	9–9½	17–18	21–23 (4 spec.)

I have already repeatedly noticed the smaller size of Central-

[1] *Oncocarpus vitiensis*. See Prof. Garrod's paper in P. Z. S. 1878 (Jan. 15th).—ED.

Polynesian specimens in comparison with examples of the true *A. superciliosa* from New Zealand. The Fiji specimens before me confirm my statement; but going again close into the matter, I feel rather doubtful with respect to our *A. pelewensis*. I formerly thought it possible to separate this form specifically by the buff coloration of the sides of head, chin, and throat, and by the imperfect dark moustache-stripe always so conspicuous in New-Zealand specimens; but the Fiji specimens prove these characters not to be constant, as No. 108 agrees perfectly with the Pelew bird, whereas No. 98 shows the dark moustache. The rusty-brown longitudinal band on the outer web of the last secondaries also, as I have noticed since, is not a constant character for *A. pelewensis*. Therefore only the smaller size remains noticeable; but in comparing the table of measurements given above it seems rather difficult to found upon this an available specific character; and I think *A. pelewensis* cannot be allowed to be more than a scarcely smaller race.

C. Birds of Api, New Hebrides.

"Our parties were landed for about three hours on Api, with orders not to wander far from the beach. During this time six specimens of birds were obtained, belonging to five species."—*J. M.*

1. Hirundo tahitica, Gm.

No. 120. Api. Female. "Eyes, legs, and bill black. Stomach contained insects."—*J. M.*

This example agrees exactly with specimens from Fiji.

2. Collocalia uropygialis, G. R. Gray.

Collocalia uropygialis, G. R. Gray, Ann. & Mag. Nat. Hist. ser. 3, vol. xvii. p. 123 (New Hebrides.)

No. 121. Api. Male.

122. „ „ . "Legs, eyes, and bill black. Stomach contained insects."—*Murray*.

This is a very remarkable species, of which I subjoin a description.

Upper parts black, with a very distinct dark steel-green stripe on the head, back, and shoulders, which, under certain lights, changes into steel blue-black on the wings and tail; on the rump a broad band of pure silky white; second and third tail-feathers with a longitudinal median patch on the basal part of the inner web; chin, throat, and sides of breast and vent dull black, remaining underparts white; under wing- and tail-coverts black with steel blue-black gloss; the anterior portion of under tail-coverts black with white apical margins; bill black; feet brownish.

Male (121) exactly like, but the white spots on the second and third tail-feathers more restricted.

Long. tot.	al.	caud.	tars.	dig. med.	
in.	in. lin.	lin.	lin.	lin.	
c. 3	3 6	18	$3\frac{1}{2}$	$2\frac{1}{2}$	No. 121.
—	„	„	„	„	122.

The tips of the wings extend beyond the end of the tail about 14 lines; the tail is entire.

The New-Caledonian bird (*C. leucopygia*, Wall. P. Z. S. 1863, p. 384) seems to differ, as we learn from M. Verreaux's original description (*C. linchi*, Verr. & Des Murs, Rev. et Mag. Zool, 1862, p. 129), specifically in the rhachis of the rump-feathers being black, and in the want of the white spot on the inner web of the second and third tail-feathers.

3. HALCYON JULIÆ (Heine).

Halcyon juliæ, Sharpe, Mon. Kingf. p. 227, tab. 86; Tristram, Ibis, 1876, p. 260.

Dacelo grayi, Schleg. Mus. P. B. Alced. (1863), p. 37.

H. sacra, F. & H. Orn. Central-Polyn. p. 32 (spec. ex New Hebrides and New Ireland? p. 34).

No. 117. Api. Female. "Eyes black; upper mandible black, lower flesh-colour; legs greyish; the stomach contained insects, and a small molluscous shell"—*J. M.*

When placed among an extensive series of *H. sacra*, this specimen seemed to be nothing more than a dull-coloured specimen of that species, having the greenish shine of the back exactly the same as in No. 7 (from Tongatabu); but the same dull green also prevails on the head; and this would form the only mark of distinction. The rufous band round the head is not so developed as in Sharpe's plate; there is only a buff supercilium; and the head-band is only indicated by some buff feathers; the neck-collar is white, not buff; the black band which runs from beneath the eyes round the hind neck is very narrow.

A specimen in the Bremen Museum, said to be from New Ireland (procured from Mr. Frank), and described by us (*l. c.*) as *H. sacra*, agrees perfectly with Sharpe's plate, and may be considered to be also *H. juliæ*.

4. ARTAMUS MELALEUCUS, Forst.

Loxia melaleuca, Forst., Licht. Descr. Anim. 1844, p. 272.

No. 119. Api. Male. "Bill light blue, the tip black; eyes hazel; legs black; the stomach contained insects, chiefly beetles."—*J. M.*

Exactly like specimens from New Caledonia; the wing a trifle shorter.

Long. al.	caud.	rostr. a front.	Latit. rostr. a basi.	Long. tars.	
in. lin.	in. lin.	in.	in.	in.	
4 9	2 3	$7\frac{1}{2}$	$4\frac{1}{2}$	7	New Hebrides.
4 11–5 2	2 5	$7\frac{1}{2}$	$4\frac{1}{2}$	8	New Caledonia.

The New Hebrides seems to be a new locality for this species. On its differences from the nearly allied *A. pelewensis*, Finsch, cf. Journ. Mus. Godeffr. Heft xii. 1876, p. 41.

5. Carpophaga pacifica (Gm.)

No. 118. Api. "Male, young. This bird was in poor condition, and had nothing in the stomach. Bill blackish-blue; legs dull red eyes brown."—*J. M.*

This is a young bird, with not full-grown wings and tail-feathers (wings only 6″ 11‴, tail 4″), but in coloration exactly like older ones from the Tongas. Some of the tail-feathers and secondaries show the singular hairy filaments which denote a young bird still unable to fly.

D. Birds of Tahiti, Society Group.

The 'Challenger' remained at Tahiti from the 18th of September till the 2nd of October, 1875. Sixteen specimens of birds were collected, which I refer to four species.

1. Callocalia fuciphaga (Thunb.).

Callocalia cinerea, Finsch, Journ. Mus. Godeffr. Heft xii. 1876, p. 25.

C. fuciphaga, Wall. P. Z. S. 1863, p. 384; Sclat. P. Z. S. 1865, p. 616.

No. 559. Tahiti. Male.
No. 560. „ „
No. 561. „ Female. Eyes black.

Long. al. in.	lin.	rectr. interm. lin.	rectr. extern. lin.		
4	7	21	26	No. 559.	Tahiti.
4	6½	22	26	560.	„
4	7	22	26	561.	„
4	9	25	27		*teste* Pelzeln.
4	5	19	23	*fuciphaga*,	Java.
3	11	18	20	*vanicorensis*,	Ponapé (8 ex.).
4	2	20	22		
4	0	19	21	*francica*,	Bourbon.

Having now, for the first time, the opportunity of examining specimens of the *Collocalia* of Tahiti, I find no specific distinctions from the well-known *C. fuciphaga*, so widely distributed in the Indian and Malay archipelagos. The specimens before me are not of so light a greyish-brown as one would expect from the descriptions sent me by Herr von Pelzeln; on the contrary, the whole under-surface is a little darker than in Javan specimens; but the difference is so slight that no character can be based on it.

C. vanicorensis corresponds in coloration exactly, but may perhaps be kept separate on account of the smaller size. From the latter, *C. francica*, Gm. (from Bourbon and Madagascar), seems scarcely separable; only the under tail-coverts show a more intense green gloss. Mr. Wallace (*l. c.*) is perhaps right in uniting also these two latter species under *C. fuciphaga*.

2. Halcyon veneratus, Gm.

Halcyon veneratus, Sharpe, Mon. Kingf. p. 245, t.

No. 548. Tahiti. Male.
549. „ „
550. „ „
551. „ „
552. „ „
553. „ Female.
554. „ „
555. „ „
556. „ „

The excellent series before me does not confirm the view that either the dark band across the breast, or the more bluish green, or the duller brown coloration of the upper parts is peculiar to a certain state of age or sex. All are apparently old specimens, and show every gradation in these characters.

The dull brownish tone passing into verdigris prevails in most of the specimens; only No. 5, 548 (male), and 554 (female), are more of a greenish-blue, especially on the head and wings; these specimens have no dark breast-band, this being only faintly shown by rusty tips of the feathers. No. 551 (male) has scarcely any indication of a breast-band (resembling, therefore, the right-hand figure on Sharpe's plate). In No. 5, 550 (male) and 552 (male) the breast-band is on a rusty ground-colour, speckled with blackish, in the remaining specimens more or less of a brownish black.

The length of "wings," varies from 3″ 3‴ to 3″ 7‴.

Mr. Layard enumerates *H. veneratus*, from Tonga (P. Z. S. 1876, p. 501), but probably obtained the specimen here.

3. Ptilonopus purpuratus (Gm.)

Ptilonopus purpuratus, F. & H. Orn. Central-Polyn. p. 122.

No. 557. Tahiti. Male,
558. „ Female.

"Feet violet; eyes orange; bill green at the base, tip yellow." —*J. M.*

I am pleased to have an opportunity of examining the *Ptilonopus* of the Tahiti group, which is so rare in collections; and as the description given in the 'Ornithology of Central Polynesia' (being copied from Peale) turns out to be incorrect in some points, I think it necessary to give a new one.

Male. Front and vertex delicate purplish-lilac, forming a pale and, not as usual in the members of this genus, circumscript head-cap; remainder of head, neck, and under surface ashy-grey with only a very faint greenish tinge, more visible on the middle of the breast and vent; throat-feathers bifurcate in the centre tinged with pale dull yellow-greenish; lower vent whitish, under tail-feathers citron-yellow; tarsal feathers ashy-grey; back, wings, and tail bright grass-green; on the mantle and shoulders with a bronzy shine under certain lights; remiges slaty black on the outer webs, tips dark

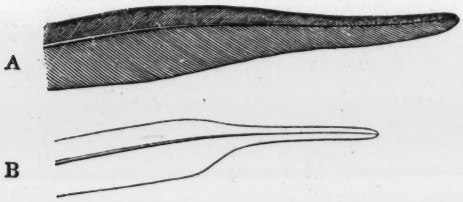
green; secondaries margined externally very narrowly with yellow; under wing-coverts ashy grey, the under-surface of wings darker; tail-feathers with a grey cross band above the ends, scarcely visible on the outer web; tail from below ashy grey, with an ill-defined white cross band above the end.

Female like the male.

Long. tot. lin.	al. in.	al. lin.	caud. in.	caud. lin.	rostr. a front. in.	tars. lin.	dig. med. lin.	
c. 8	5	5	2	9	5	12	$9\frac{1}{3}$	♂
	5	7	2	9	$4\frac{1}{3}$	12		♀

Peale's figure is somewhat incorrect; the head appears too blue, and has no purplish-red margin; the remiges are not coloured blue.

The very interesting fact of the very localized distribution of the numerous species of the genus *Ptilonopus* in the Pacific archipelago is most strongly exemplified by this species, peculiar to the Tahiti group. The pale purplish-lilac cap and the want of the usual dark vent-spot, distinguish this species at once as regards coloration. But, besides, it is very well characterized by the



form of the first primary, which is shown in figure A, whereas in the other Polynesian species before me (*Pt. fasciatus, porphyraceus. pelewensis, ponapensis, perousei,* and *dupetit-thouarsi*) this feather is much attenuated in the apical half (see fig. B.).

4. Ardea sacra, Gm.

No. 562. Tahiti. Female.
563. ,, ,, Young.

"Eyes orange; feet and legs greenish in the adult."—*J.M.*

No. 562 is white, strongly developing slate-blue feathers; No. 563 is slate-coloured, with a broad white chin-stripe.

9. Supplementary Note on Rodents and Marsupials from Duke-of-York Island and New Ireland. By Edward R. Alston, F.L.S., F.Z.S., &c.

[Received October 6, 1877.]

In the first part of our 'Proceedings' for this year[1] I described the Rodents and Marsupials sent by the Rev. G. Brown from Duke-of-York Island and the vicinity. Mr. E. Pierson-Ramsay, F.L.S., Curator of the Australian Museum at Sydney, has, it appears, described the same species in the 'Proceedings of the Linnean Society of New South Wales;' and, as our works have thus clashed, it seems advisable to prevent any future confusion as to synonymy.

The parts of the New South Wales 'Proceedings' bear no date; but 'vol. i. pt. 4' reached England early in June, and therefore has clearly priority of our first part, published on the first of that month. Here Mr. Pierson-Ramsay describes the Kangaroo and *Perameles* of New Ireland under the names *Halmaturus brownii* and *Perameles cockerelli*. The former is, of course, my *Macropus lugens*; and I unhesitatingly withdraw the specific title in favour of Mr. Ramsay's name. The latter is the species which I identified with *P. doreyanus*, an opinion which I see no reason to change.

The third of Mr. Pierson-Ramsay's papers appears in "vol. ii. pt. 1" of the same periodical, which is clearly subsequent in date of publication to our first part; for it contains papers read at a meeting of the Society on the 25th June. Consequently Mr. Ramsay's *Mus? echimyoides* and *Mus musavora* must be regarded as synonyms of my *Mus browni* and *Uromys rufescens* respectively.

The following, therefore, is the synonymy of the new species described by both Mr. Pierson-Ramsay and myself, with the more exact information as to locality &c. which is afforded by his papers.

1. Mus browni.

Mus browni, Alston, P. Z. S. 1877, p. 123.

Mus? echimyoides, Pierson-Ramsay, P. Linn. Soc. N. S. W., ii. p. 15.

Hab. Duke-of-York Island. "The young do not differ in coloration from the adults; sexes are alike in colour."

2. Uromys rufescens.

Uromys rufescens, Alston, *tom. cit.* p. 124, pl. xviii.

Mus musavora, Pierson-Ramsay, *tom. cit.* p. 16.

Hab. Duke-of-York Island, where it is found plentifully, feeding on the plantain. "It is known to the missionaries as the *Banana Rat*."

3. Macropus browni.

Halmaturus brownii, Pierson-Ramsay, *op. cit.* i. p. 307.

Macropus lugens, Alston, *tom. cit.* p. 126, pl. xix.

Hab. New Ireland. Unfortunately Mr. Ramsay's specimen, like

[1] *Antea*, pp. 123-126.

mine, was immature; and he does not appear to have examined the dentition of a larger example which he saw in Mr. Brown's own collection. This last measured, head and body, 41 inches, tail 16 in., and was presumably adult.

It may be well to add that the Mammals described by Mr. Dobson and myself from this collection are now in the British Museum.

10. Supplément à la Liste des Oiseaux recueillis au nord du Pérou occidental par MM. Jelski et Stolzmann. Par L. Taczanowski, C.M.Z.S.

[Received Sept. 20, 1877.]

Un séjour prolongé aux environs de Tumbez a procuré à nos voyageurs plusieurs espèces d'oiseaux qui n'avaient pas été fournies dans les envois précédents[1], surtout des échassiers et des palmipèdes recueillis à Santa-Luzia. J'indique donc ici ces espèces pour compléter la liste des captures ornithologiques dans cette contrée.

Mniotiltidæ.

4. Dendrœca aureola (Gould).

Un mâle, tué à Santa Luzia le 10 février, et une femelle tuée le 27 janvier 1877. Iris brun foncé.

Mr. Sclater, qui a eu la complaisance de déterminer nos oiseaux, dit qu'ils sont identiques avec l'exemplaire de l'île Puna, qui se trouve dans la collection de Mr. Salvin.

Hirundinidæ.

2. Stelgidopteryx uropygialis, Lawr.

Un mâle tué à Lechugal le 5 octobre, 1876. Iris brun foncé.

Tanagridæ.

4. Euphonia saturata, Cab.

Deux mâles et une femelle, tués à Tumbez le 19 septembre. Iris brun foncé.

5. Nemosia guira (L.).

Une femelle, tuée à Santa Luzia le 13 janvier. Iris brun foncé.

6. Arremon abeillæi, Less.

Un mâle de Lechugal, tué le 5 octobre. Iris brun foncé.

Tyrannidæ.

19. Contopus punensis, Lawr.

Une femelle, tuée à Lechugal le 5 octobre. Iris brun foncé. Comparé avec l'exemplaire de l'île Puna.

[1] *Vide* P. Z. S. 1877, p. 319.

TROCHILIDÆ.

3. LAMPORNIS IRIDESCENS, Gould.

Une paire, tuée à Lechugal, le 5 octobre.

4. HELIOMASTER ALBICRISSA, Gould.

Deux mâles, tués à Lechugal le 5 octobre.

FALCONIDÆ.

7. PANDION HALIAËTUS (L.).

Une femelle, tuée à Santa Luzia le 5 janvier, complétement identique aux oiseaux d'Europe. Iris jaune ; pattes cendrées claires.

8. BUTEO ERYTHRONOTUS (King).

Une femelle adulte, tuée à Tumbez le 10 septembre, et un jeune mâle de la même localité tué le 18 septembre. Iris de l'adulte et du jeune brun-noisette.

9. URUBITINGA SCHISTACEA (Sund.).

Deux mâles et une femelle de Santa Luzia, tués le 23 octobre et le 17 décembre. Iris brun foncé.

10. GERANOAËTUS AGUIA (Temm.).

Un jeune mâle, tué à Tumbez le 20 octobre. Iris gris ; la cire grise verdâtre.

11. GAMPSONYX SWAINSONI, Vig.

Deux femelles, tuées à Tumbez le 15 septembre. Iris rouge-cérise.

12. POLYBORUS THARUS, Molina.

Un mâle adulte, tué à Tumbez le 5 février. Iris gris brunâtre, assez clair ; la cire, les parties nues du visage et les pattes orangées.

PHALACROCORACIDÆ.

1. PHALACROCORAX BRASILIANUS (Gm.).

Un jeune oiseau, tué sur le fleuve Tumbez le 11 janvier. Iris gris.

ARDEIDÆ.

2. ARDEA CANDIDISSIMA, Gm.

Une paire de Santa Luzia, dont le mâle a été tué le 6 janvier, et la femelle le 15 novembre. Iris du mâle est jaune uniforme ; celui de la femelle aussi jaune, mais d'une nuance plus foncée vers le bord externe.

3. ARDEA CÆRULEA, L.

Deux femelles de Santa Luzia, tuées le 17 novembre et le 12 décembre. Iris jaune de paille.

4. Butorides virescens (L.).

Une paire de Santa Luzia, tuée le 17 septembre et le 25 octobre. Iris jaune.

5. Nycticorax violaceus (L.).

Une paire de Santa Luzia, tuée le 3 et le 22 novembre. Iris du mâle est rouge orangé à l'intérieur, et orangé à l'extérieur; celui de la femelle est jaune à l'intérieur et orange foncé à l'extérieur.

Plataleidæ.

1. Platatea ajaja, L.

Un mâle, tué à Santa Luzia le 1 décembre. Iris est rouge brunâtre, avec une bordure externe grise; le passage entre ces deux couleurs est graduel, s'effectuant par des taches. Le tour dénudé des yeux est d'une couleur chair-pâle, variée çà et là de taches bleues.

Ibidinæ.

1. Ibis alba (L.).

Quatre adultes et un jeune, de Santa Luzia, tués depuis le 25 septembre, jusqu'au 20 décembre. Tous les adultes ont dans cette saison plus ou moins de plumes grises au cou. Iris des adultes est bleu, avec une bordure externe blanche; celui du jeune bleu clair uniforme.

Anatidæ.

1. Querquedula cyanoptera (Vieill.).

Une paire et un poussin de Santa Luzia.

1. Penelope albipennis, sp. nov.

Fusco olivacea, dorso, alis caudaque virescente nitentibus; pileo et collo albido striatis; primariis albis fusco terminatis; facie nuda obscure violaceo-livida; gula nuda aurantiaca; iride pallide brunnea.

Un mâle, fourni par M. Stolzmann de Santa Luzia, tué le 18 décembre 1876, paraît être jeune, prenant sa deuxième livrée. La couleur générale des parties supérieures est olive foncée, avec un éclat verdâtre metallique assez fort, à peu près comme celui de la *P. marail* de la Guyane; les plumes du dessus de la tête sont entourées d'une fine bordure cendrée blanchâtre, celles de la gorge, de la poitrine et de la partie inférieure du cou liserées des deux côtés d'une bordure blanche; les plumes du ventre, du croupion, des couvertures sus- et les sous-caudales, appartenant à la deuxième livrée, sont aussi olives foncées, un peu luisantes, et finement ondulées de roussâtre, tandis que celles du plumage précédent sont brunâtres, un peu moins foncées avec l'ondulation rousse plus distincte. Les huit remiges primaires sont blanches avec la base et l'extrémité foncée, la neuvième est un peu blanchie vers le milieu; les autres remiges sont un peu plus foncées que le manteau, et les rectrices sont noires, avec un éclat verdâtre un peu plus fort qui celui du dos. Les côtés du visage parfaitement nus, sont d'une couleur bleuâtre violacée foncée, excepté une

moustache emplumée noire, commençant vis-à-vis du milieu de l'œil; le sac guttural est orangé; l'iris est brun clair, les pattes rougeâtres, bec noirâtre.

	millim.
Longueur de l'aile pliée	32·5
„ de la queue	32·5
„ du bec depuis la commissure	51
„ du bec depuis les narines	17
„ du tarse	85
„ du doigt du milieu, avec l'ongle	91

La couleur blanche des remiges primaires de cet oiseau fait l'effet de l'albinisme, mais M. Stolzmann avant de se procurer l'exemplaire a répété plusieurs fois dans ses lettres, que toutes les Pénélopes qu'il a vues au vol dans cette localité avaient l'extrémité des ailes blanches, ce qui m'a décidé à le considèrer comme forme distincte. Il dit ensuite que cette Pénélope se trouvait autrefois tout près de la ville de Tumbez, et qu'elle y est exterminée depuis une trentaine d'années. Actuellement il ne reste qu'une trentaine de paires dans la partie boiseuse de la delte de Tumbez, près de Santa Luzia, où elles disparaitront bientôt à cause des persecutions. Il serait intéressant de savoir si cette forme, voisine de la *P. ortoni*, Salvin, se trouve aussi dans les forêts voisines sur le territoire de l'Equadeur.

Rallidæ.

2. Rallus cypereti, Stolzm. MS.

Supra olivaceo-griseus fusco maculatus; collo, pectore et striga superciliari flavis; gula abdomineque medio albis; alis caudaque olivaceo-griseis; hypochondriis subalaribusque albo et olivaceo transfasciatis. Rostri brunnei mandibula inferior flavida; pedes olivaceo-carnei; iris rubro-brunnea.

Forme très-voisine du *R. longirostris*, Vieill. La couleur générale des parties supérieures du corps est d'un gris olivâtre pâle; le dessus de la tête et la nuque sont d'une teinte plus foncée avec des bordures des plumes claires, très-fines et peu distinctes; tout le dos est varié de grosses taches foncées, qui occupent largement le milieu de chaque plume. La gorge est blanche, ainsi que le milieu du ventre; le bas des côtés de la tête, le devant du cou, et la poitrine, ainsi qu'une strie entre la naissance du bec et le bord antérieur de l'œil sont d'une couleur fauve roussâtre claire; un croissant blanc se trouve sur la paupière inférieure dans toute la longueur de l'œil; les côtés du ventre et le bas-ventre sont olive-foncé, striées transversalement de blanc. Les ailes et la queue sont de la couleur du dos; les sus-alaires lavées de roussâtre, les sous-alaires olive-foncé, variées transversalement de raies blanches, fines et peu nombreuses; les plus grandes couvertures inférieures de la queue sont blanches rayées en travers d'olive foncé, les autres blanches en entier. Le bec est brun corné, avec la mandibule inférieure jaunâtre dans sa plus grande moitié basale, ainsi que le bord de la mandibule supérieure; les pattes sont d'une couleur carnée olivâtre; l'iris brun rougeâtre.

Dans les deux sexes la coloration ne présente aucune différence.

	♂ millim.	♀ millim.
Longueur de l'aile pliée	137	125
„ de la queue	60	60
„ du bec, depuis la commissure	52	51
„ du tarse	44	40
„ du doigt du milieu	40	37
„ de l'ongle	9	8
„ du pouce	11	10
„ de l'ongle	5	4

Trois exemplaires de Santa Luzia, tués dans la deuxième moitié de janvier.

Selon la communication de M. Stolzmann l'oiseau est très-commun dans la partie marécageuse de la delte de Tumbez, aux environs de Santa Luzia.

3. Porzana carolina (L.)?

Une paire, tuée à Santa Luzia le 12 et le 15 janvier. Iris gris au milieu, et brun rougâtre à l'extérieur.

Hæmatopodinæ.

1. Hæmatopus palliatus, Temm.

Un mâle, tué à Santa Luzia le 25 octobre. Iris orangé.

Scolopacidæ.

6. Macrorhamphus griseus (Gm.).

Une paire, en plumage d'hiver, tuée à Santa Luzia le 28 octobre et le 22 novembre. Iris brun foncé.

7. Tringa canutus, L.

Une paire, en plumage d'hiver, tuée à Santa Luzia le 31 octobre. Iris presque noir.

8. Symphemia semipalmata (Gm.).

Trois exemplaires, en plumage d'hiver, tués à Santa Luzia le 27 novembre et le 13 décembre.

9. Limosa fedoa (Lath.)

Une paire, en plumage d'hiver frais, tuée à Santa Luzia le 27 octobre et le 23 novembre.

10. Himantopus nigricollis (Vieill.).

Trois exemplaires, tués à Santa Luzia le 28 octobre et e 27 novembre. Iris brun, avec un anneau externe rouge.

LARIDÆ.

1. STERNA MAXIMA, Bodd.

Un squelette, de Santa Luzia.

2. STERNA MACRURA, Naum. (*S. arctica*, Temm.).

Un exemplaire, tué à Tumbez, le 19 septembre 1876. Déterminé par M. Howard Saunders.

3. LARUS ATRICILLA, L.

Une jeune femelle, prenant sa deuxième livrée, tuée le 20 décembre 1876, à Santa Luzia. Déterminé par M. Howard Saunders.

Sur les 34 espèces de ce supplément il y a 31 qui n'ont pas été fournies par M. Jelski de ses excursions précédentes, ce qui joint à 72 espèces de la même catégorie de la liste précédente, fait en tout 103 espèces des environs de Tumbez, qui n'ont pas été trouvées dans les contrées du Pérou central, visitées par le même voyageur.

MIMUS LONGICAUDATUS, Tsch.

Les nombreuses pontes de cet oiseau ont été recueillies depuis le 4 jusqu'au 25 février. Dans toutes on trouvait trois ou quatre œufs, une seule ponte du 25 février contenait cinq. Ces œufs ressemblent beaucoup à ceux du *Turdus merula* d'Europe, mais en général ils sont un peu plus petits et moins atténués au petit bout. En coloration ils présentent des variétés aussi nombreuses comme parmi les œufs du merle d'Europe. Le fond est également vert, d'une nuance plus ou moins intense ; les taches sont d'une couleur brun roussâtre (rouille), qui sur les uns sont très-petites et nombreuses sur toute la surface, également distribuées partout, ou plus denses et plus grandes au gros bout. Dans les autres les taches sont plus grandes, plus foncées, beaucoup moins nombreuses et le plus souvent plus denses au gros bout. Il y a aussi une ponte bien différente des autres en ce que le fond est fort barbouillé, de sorte que la couleur de la coquille est effacée en grande partie. Les œufs de chaque ponte sont plus ou moins également colorés. Dimensions :

(1) millim.	(2) millim.	(3) millim.	(4) millim.	(5) millim.
25, 20	26·7, 19·8	26·2, 20	25·7, 20	28·8, 20·2
25, 20	27, 20	26·2, 19·8	25·8, 20	29 21
25, 20·2	28·5, 20·7	27, 20	26, 20	29·2, 20·2
			27, 20	

CAMPYLORHYNCHUS BALTEATUS (Baird), *anteà*, p. 319.

Un nid, trouvé le 19 février 1877, contenait trois œufs d'un blanc pur et mat, ovés allongés, à petit bout aigu. Dimensions : 23·3, 16 ; 23·3, 16·5 ; 23·8, 16·5 millim.

THRYOTHORUS SUPERCILIARIS, Lawr., *anteà*, p. 319.

Les œufs, trouvés le 29 janvier et le 20 février, sont blancs, légèrement verdâtres, surtout en transparence, avec un lustre très-faible. Le premier contenait trois œufs, le deuxième un. Dimensions de ceux de la première ponte : 20, 14·5 ; 20·4, 15 ; 20·6, 14·8 millim.

Polioptila albilora, Scl., *anteà*, p. 319.

Le nid de cet oiseau, appliqué à une grosse branche à peu près comme celui du Pinson, est petit et soigneusement construit. Il a la forme d'un cylindre bas, assez régulier, à parois minces, d'une texture solide et très-serrée. Il est construit d'un mélange de brins d'herbes sèches fines, de duvets végétaux et des différentes autres matières, comme des brins d'*Usnea*, des fils, de petits morceaux de papier, etc. L'intérieur est assez profond et nettement tapissé dans les uns de crin de cheval mélangé avec un peu de plumes, dans d'autres de duvets végétaux avec un peu de brins de plantes très-délicats. Leur surface externe ressemble à celle des nids de *Hypolais*. Diamètre du nid, 50–60 ; hauteur, 30–40 ; diamètre de l'intérieur, 40 ; profondeur, 25 millim. Les nids trouvés entre le 7 et le 25 février contenaient 2–4 œufs frais.

Les œufs par leur forme et le mode de la coloration ressemblent à ceux de la *Muscicapa grisola*, leur fond est vert pale ou blanc verdâtre, avec des taches d'un brun rougeâtre, plus ou moins rares sur toute la surface et réunies en un anneau assez dense près du gros bout. D'autres ressemblent plutôt aux œufs du Chardonneret ; leurs taches sont petites et peu nombreuses sur toute la surface, avec la couronne beaucoup moins fournie que dans les précédents. En général les taches de la gamme inférieure sont pâles, les superficielles beaucoup plus foncées. La surface est presque mate. Dimensions des œufs de trois pontes :

	millim.	millim.	millim.
(1)	13·3, 10·6 13·8, 10·8 14, 11 14, 12·2		
(2)		13·5, 10·7 13·8, 11	
(3)			15·3, 11·6 15·3, 11·7

Gnathospiza raimondii, Tacz., *anteà*, p. 320, pl. xxxvi. fig. 1.

M. Stolzmann communique "qu'en février cet oiseau est très nombreux dans la contrée, au mois de mars il disparaît des environs de Tumbez, et se rend ailleurs pour nicher, mais nous ne savons pas où. En mai il revient. Quelquefois il se mêle aux troupes de *Sycalis flaveola* pour se nourrir ensemble de sémences de graminés. Il se tient seulement sur les steppes et sur les lomas (monticules arides). On ne le trouve jamais au voisinage des cours d'eau, où la végétation est plus forte."

Hæmophila stolzmanni, Tacz., *anteà*, p. 322, pl. xxxvi. fig. 2.

"L'oiseau n'est pas trop commun dans la contrée, mais en connaissant les endroits dans lesquels il séjourne, et sa voix fine, semblable à celle des Tanagrides, chaque jour on pourrait tuer quelques uns."

Aphobus chopi (Vieill.), *anteà*, p. 323.

Les nids, recueillis entre le 19 et le 23 février, contenaient deux, trois ou quatre œufs frais. La forme des œufs est ovée, plus ou moins oblongue. La coquille est verte, à peu près de la nuance des

œufs du *Carpodacus erythrinus*, avec un lustre assez fort. La maculature est composée de veines entortillées, assez fines et assez courtes, mêlées à quelques petites taches et quelques petits points noirs, et d'autres d'un gris violacé pâle. Ces veines sont rassemblées au gros bout pour y former une couronne peu fournie, tandis que sur le reste de la surface il y a seulement quelques points et rarement une petite veine. Un œuf a le sommet barbouillé d'un réseau de veines, et quelques points sur le reste de la surface. Sur d'autres, au lieu de veines il y a des taches et quelques stries rassemblées aussi au gros bout. Dans une ponte les œufs sont sans maculature, ils n'ont que quelques taches rougeâtres, très-pâles, à peine distinctes; ces œufs étaient accompagnés d'un œuf de *Molothrus*, dont la moucheture, composée de points pâles est beaucoup plus nombreuse, et beaucoup plus distincte; le vert du fond de cet œuf est d'une nuance un peu plus pâle que celui des œufs de l'*Aphobus*. Dimensions :

millim.	millim.	millim.	millim.
(1) { 26, 20·2 27, 20	(2) { 27·2, 20·3 27·3, 20	(3) { 28·6, 20 30, 20·2	(4) { 29·8, 18 30·5, 18·6

QUISCALUS ASSIMILIS, Scl., *anteà*, p. 323.

M. Stolzmann dit qu'il est assez commun aux environs de Santa Luzia, et qu'il se nourrit de crustacés marins. En volant il a l'habitude d'étendre sa queue de sorte qu'observé de côté il paraît la porter en travers.

Deux nids de cet oiseau, trouvés à la fin de janvier et au commencement de février, contenaient chacun deux œufs. Ces œufs sont ovés allongés, à petit bout plus ou moins obtus; leur fond est d'un vert pâle, à peu près comme celui du Pinson d'Europe, varié de quelques veines noires foncées et d'autres grises violettes pâles, grosses et plus ou moins fines, fort entortillées et mêlées avec quelques taches de la même couleur; les veines sont rassemblées en une sorte de couronne, très-irrégulière, dans une des extrémités ou au milieu de l'œuf; quelques autres veines, ordinairement plus courtes, quelques points et quelques taches sont éparses sur le reste de la surface. Les bords de ces grosses veines et des grosses taches sont lavées en une couleur rose, qui colore une grande partie de la surface du fond, comme cela a souvent lieu sur les œufs mentionnés plus haut. Le lustre est très-faible. Dimensions :

millim.	millim.
(1) { 31·6, 24 31·6, 24·6	(2) { 32, 22·4 37·6, 23

SYNALLAXIS STICTOTHORAX, Scl., *anteà*, p. 323.

Un œuf trouvé le 25 janvier, et trois le 18 février, à Santa Luzia, sont d'un blanc mat, de forme ovée, médiocrement allongée. Dimensions : 16·2, 13·5 ; 18·2, 13·3 ; 18·4, 13 millim.

FURNARIUS CINNAMOMEUS, Lafr., *anteà*, p. 323.

Les œufs frais se trouvaient dans la deuxième moitié de février.

Leur forme est ovée, plus ou moins oblongue, il y avait aussi des œufs exceptionnels presque elliptiques. Ils sont blancs purs, avec un lustre assez fort; blancs aussi en transparence. Leur surface est pour la plupart barbouillée de boue, en différents degrés. Dimensions: 26, 19·8; 26·2, 20; 27, 21; 28·3, 19·8; 28·5, 21; 29·5, 21·2; 30, 20·3 millim.

Ochthœca salvini, Tacz., *anteà*, p. 324.

M. Stolzmann dit: "Assez commune aux environs de Tumbez, et je pouvais la rencontrer à chaque excursion en me dirigeant par sa voix, qui m'est bien connue. Elle se tient dans des petits fourrés et jamais je ne l'ai pas vue dans les endroits découverts. Elle se perche sur les branches peu élevées au dessus du terrain (environ 1–1½ mètres), et jamais je ne l'ai pas rencontrée par terre. Sa voix consiste en un sifflement monotone plaintif, assez rarement répété. Ses mouvements ressemblent à ceux du *Pyrocephalus rubineus*; en se lançant sur les insectes elle claque avec les ailes comme beaucoup d'autres Tyrans, mais pas aussi fort que le *Pyrocephalus*."

Phyllomyias tumbezana, Tacz., *anteà*, p. 325.

M. Stolzmann dit: "Il est si commun aux environs de Tumbez, que presque sur chaque arbre de la contrée on rencontre au moins une paire, et à Santa Luzia il est certainement le plus commun oiseau; dans une journée je pourrais me charger de tuer 60–100 exemplaires. Sa ponte se compose constamment de deux œufs, qui ont été recueillis entre le 8 et le 25 janvier." Ensuite nos voyageurs ont trouvé aussi cet oiseau aux environs de Pacasmayo.

Les œufs sont blancs jaunâtres unicolores, sans aucun lustre. Dimensions des deux pontes :

	millim.		millim.
(1)	17·4, 13·3 17·6, 12·7	(2)	17·6, 13·6 17·6, 13·8

Pyrocephalus rubineus (Bodd.), *anteà*, p. 326.

Oiseau commun dans la contrée. Les œufs ont été recueillis en novembre et en février; il y avait deux ou trois dans la ponte. Ils sont ovés médiocrement allongés, variant beaucoup entre eux sous le rapport de l'amincissement du petit bout, qui dans les uns est fort aminci et aigu, tandis que dans les autres il est beaucoup plus gros et plus obtus à l'extrémité. La coquille est sans aucun lustre, jaune verdâtre pâle, ou jaunâtre pâle, sans nuance verdâtre, variée de grosses taches cendrées pâles et olives foncées, réunies en un anneau près du gros bout, outre lequel il n'y a presque point de taches sur le reste de la surface, ou quelques petites, peu signifiantes; la couronne est très-dense et presque continué; sur d'autres elle est moins fournie et composée de taches plus petites, alors le reste de la surface est beaucoup plus tacheté qu'ordinairement. Dimensions

	millim.	millim.	millim.	millim.
(1)	17, 13·5 17·2, 13·7 18, 14	(2) 17, 13·6 18, 13·8	(3) 18·4, 14·2 18·8, 13·8	(4) 18·8, 13·6 18·8, 13·8

MYIODYNASTES ATRIFRONS, Scl., *anteà*, p. 326.

Les œufs recueillis depuis le 18 jusqu'au 25 février étaient frais, et pour la plupart en pontes incomplètes, deux nids seulement renfermaient trois œufs. Ils sont d'une forme ovée assez allongée; la coquille est d'un blanc pur, délicat, d'un lustre très-faible. Les taches sont des deux gammes: les unes cendrées violâtres assez pâles, les autres rouges brunâtres foncées, elles sont en général petites et peu nombreuses sur toute la surface; plus grandes et réunies en une couronne plus ou moins dense près du gros bout; sur quelques-uns cependant la couronne est peu signifiante; la forme des taches est pour la plupart longitudinale dans le sens de la longueur de l'œuf. Ce mode de la coloration ressemble à celui des œufs du *Lanius collurio*, variété tachetée de rouge. Dimensions:

	millim.	millim.	millim.
(1)	26·3, 19 25·5, 19·6 27·2, 19		
(2)		26·3, 20 27, 20·6	
(3)			27, 20 27·3, 20·2

TYRANNUS NIVEIGULARIS, Scl., *anteà*, p. 326.

Trois nids ont été trouvés le 18, le 20, et le 29 février, avec des œufs frais; deux en avaient trois œufs chacun. Ces œufs ressemblent beaucoup à ceux du *Myiodynastes atrifrons*, mais ils sont beaucoup plus petits, à coquille d'une teinte légèrement jaunâtre et le lustre plus fort. Les taches sont comme dans l'espèce citée, la teinte cependant des superficielles est brunâtre sans nuance rouge. Dimensions:

	millim.	millim.	millim.
(1)	22·8, 17 23, 17·3 23·8, 17·4		
(2)		23, 17·2 23·6, 16·6 24, 17	
(3)			25, 17·6 25·6, 17·2

CROTOPHAGA SULCIROSTRIS, Sw., *anteà*, p. 328.

Les œufs ont été récueillis en grand nombre à la fin de février; les pontes se composaient de trois ou de quatre exemplaires. Ils sont beaucoup plus petits que ceux du *C. ani*. Dimensions:

	millim.	millim.	millim.	millim.
(1)	29, 23 28·8, 22·6 30·4, 23			
(2)		29·3, 21·3 30, 21·8 30, 22·7		
(3)			29·6, 24·4 30, 24·4 30, 23·5 30, 24·8	
(4)				30·2, 21·5 32·2, 22·8 32·8, 23·3

PSITTACULA CŒLESTIS, Less., *anteà*, p. 329.

Les œufs recueillis dans la deuxième moitié de février. Dimensions des œufs des différentes pontes: 17·6, 15; 18·7, 16; 19·6, 17·3; 18·7, 14·2; 19·2, 15·6; 21, 16·2 millim.

CHORDEILES PRUINOSUS, Tsch.

Les œufs ont été recueillis à Santa Luzia depuis le 23 janvier, jusqu'au 19 février; dans une seule ponte on a trouvé deux œufs, dans toutes les autres un seul. Les œufs ressemblent beaucoup à

ceux du *Caprimulgus europæus*; mais ils sont beaucoup plus petits, à maculature composée généralement de taches petites et nombreuses, parmi lesquelles il y a souvent des stries. Les taches pâles sont en général beaucoup plus nombreuses que celles de la gamme superficielle. Dimensions: 26, 19·2; 26·2, 20·2; 26·2, 19·5; 27·2, 20; 28·2, 20·3; 28·2, 19·5 millim.

COLUMBULA CRUZIANA (Knip et Prév.).

Les œufs d'une ponte présentent les dimensions suivantes: 23, 17; 23, 18·8 millim.

November 20, 1877.

Prof. W. H. Flower, F.R.S., V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of October 1877.

The total number of registered additions to the Society's Menagerie during the month of October was 93, of which 37 were by presentation, 29 by purchase, 1 by exchange, 9 by birth, and 17 were received on deposit. The total number of departures during the same period, by death and removals, was 127.

The most noticeable additions during the month of October were as follows:—

1. A Layard's Flying Squirrel (*Sciuropterus layardi*[1]), presented by Sir Charles Peter Layard, October 8th. This is the first example of this elegant little Ceylonese animal that has reached our collection.

2. A pair of East-African Buffalos (*Bubalus æquinoctialis*), purchased 27th October.

This is the animal lately described in our 'Proceedings' by Sir Victor Brooke (P. Z. S. 1875, p. 457), from a specimen living in the Zoological Gardens at Berlin, and there first well distinguished by him from the allied South-African species (*Bubalus caffer*), of which we have likewise living examples.

Mr. Howard Saunders exhibited a skin of the rare Aleutian Tern (*Sterna aleutica*), from Alaska, and made some remarks on its intermediate position between the true Terns (*Sterna*) and the Sooty Terns (*Onychoprion*).

The following papers were read:—

[1] *Sciuropterus layardi*, Kelaart, 'Prodromus Faunæ Zeylanicæ,' p. 56; Tennent's Ceylon, vol. i. p. 148.

ORIOLUS ASSIM



Hanhart imp.



J.Smit lith. Hanhart imp.

1 PHYLLORNIS FLAVIPENNIS 2 PRIONOCHILUS QUADRICOLOR



1/2

MEGAPODIUS PUSILLUS

1. Contributions to the Ornithology of the Philippines.—No. II. On the Collection made by Mr. A. H. Everett in the Island of Zebu.

By Arthur, Marquis of Tweeddale, F.R.S., President of the Society.

[Received November 2, 1877.]

(Plates LXXVI.–LXXVIII.)

In the month of March last Mr. Everett, with the intention of extending his exploration of the Philippines, quitted Luzon[1], and proceeded to the island of Zebu, where he remained during April and the first few days of May engaged in collecting zoological specimens. Since 1872, when Zebu was visited for the first time by a zoological collector (Dr. A. B. Meyer[2], who then obtained eighteen species of birds), only two parties of naturalists (Dr. Steere and those attached to the 'Challenger' Expedition) have landed there; and they increased the number of known Zebu species to twenty-three. Of the important collection made by Mr. Everett during the few weeks he remained on the island I now propose to offer an account. Most of the birds collected in March were obtained by him near some coal-mines situated about 12 miles to the north of the port of Zebu, and some 6 miles inland. Mr. Everett writes, "The station is not very favourable for birds as compared with Luzon. Both the species and the number of individual birds seem less numerous.... *Tanygnathus luzonensis* and *Cacatua hæmaturopygia* are very abundant here, both flying wild in flocks. I saw neither of these birds in the neighbourhood of Manila. I am told of another Cockatoo, similar to *C. hæmaturopygia*, but with a red splash on the breast; but I have been unable to secure a specimen."

The birds collected in April were, I presume, obtained in the vicinity of the port of Zebu itself. Mr. Everett expresses himself dissatisfied with the results of his labours in the island, an attack of fever having confined him for some time to the house. Notwithstanding this, he has very considerably extended our knowledge of the avifauna of Zebu, having succeeded in securing 282 specimens of birds, representing 75 species.

When Mr. Everett commenced his researches in Zebu, only 23[3] species of birds had been recorded as being inhabitants of that island. Yet he was able during the short period of his stay to add 54 species to our lists of its avifauna. These 54 species include 6 hitherto undescribed, viz.:—

Oriolus assimilis.
Phyllornis flavipennis.
Zosterops everetti.
Prionochilus quadricolor.
Turnix nigrescens.
Megapodius pusillus.

[1] *Antea*, p. 686.

[2] Trans. Zool. Soc. ix. p. 125.

[3] 18 given in my memoir (*l. c.*), 1 obtained by Dr. Steere (Sharpe, Tr. L. S. ser. 2, Zool. i. p. 309), and 4 by the 'Challenger' Expedition (*antea*, p. 538). I enumerated (*l. c.*) only 3 additional Zebu species, having through an oversight omitted *Numenius phæopus*.

Two known species, though new to the Philippine fauna—

Hirundo javanica, *Rallina eurizonoides*.

and two typical Indo-Malayan genera are added to the Philippine area, as restricted by me[1]—

Phyllornis, *Prionochilus*.

The known species of Zebu birds therefore now number 78, of which no less than 75 are represented in Mr. Everett's collection. The grand total of species inhabiting the Philippine area (as restricted by me, *l. c.*) Mr. Everett has increased by 8, and it now amounts to 276. Several of the species discovered by Mr. Everett in Zebu possess a peculiar interest. Such are:—*Oriolus assimilis*, a representative form of the remarkable *O. steerei* of Negros and Basilan[2]; *Xantholæma rosea*, hitherto, beyond Java and Sumatra, only known from Negros; *Dicrurus mirabilis*, *Æthopyga magnifica*, *Anthothreptes chlorogastra*, *Dendrophila œnochlamys*, all four hitherto only known from Negros, but which reappear in Zebu. Four Passerine species, of which the only previously known habitat was Luzon—*Volvocivora* (?) *cærulescens*, *Parus elegans*, *Oxycerca everetti*, and *Megalurus ruficeps*—have their range extended to Zebu.

1. Cacatua hæmaturopygia (1)[3].

[Cebu, male, March, "pairing." Iris dull carmine, bill light lead-grey, feet and nails dark lead-grey. *b*. Female, March, "breeding." Orbital skin white, rest as in male.]

Another example of a female is marked "breeding in April." The dimensions of the male somewhat exceed those of the female.

2. Prioniturus discurus (2).

The crown of the head in six examples of both sexes, belonging to a series of seven obtained in April, is bright verditer-blue. In the seventh the blue crown is less distinct. The elongated spatulate shafts of the middle rectrices vary in length in each specimen. The plumage of the two sexes is alike.

3. Tanygnathus luzonensis (3).

[Cebu, female, April, "pairing." Iris, outer ring yellowish white, inner ring yellow-brown; maxilla scarlet, tip yellow; mandible orange, tip yellow; feet dirty greenish, nails dark grey.]

Not to be distinguished from Luzon, Negros, and Guimaras examples. The "pairing" male has the forehead verditer-green, the crown and nape verditer-green, each feather tipped with turquoise-blue. The cheeks are green; and there is no blue on the back or uropygium. Females (sex ascertained by Mr. Everett) are somewhat smaller, but in plumage and colouring do not differ from males.

[1] *Antea*, p. 687.

[2] The Basilan form will probably prove to be a third representative species.

[3] The numbers following the titles are the same as those of my Memoir, Trans. Zool. Soc. ix. pp. 125–252.

4. Loriculus chrysonotus (8).

[Cebu, male, April. Iris brown, bill orange-red, legs orange, nails brown.]

5. Microhierax erythrogenys (10).

A single example (female) is in the collection, shot in April, and in full black and white plumage. The wing measures 4·87.

6. Spilornis holospilus (16).

[Cebu, male, March. Iris deep golden yellow, orbital skin yellow, cere the same, but tinged with green; bill leaden grey, culmen and tip black; legs and feet dirty light yellow, the feet darkest, claws black. *b*. Female. Iris green-yellow, orbital and loral regions bright yellow, with a slight green tinge; cere dull greenish, bill lead-grey, tip and culmen black; legs and feet dirty light yellow, claws black.]

7. Haliastur intermedius (17).

[Cebu, male and female, April. Iris warm chocolate, bill grey tinged greenish yellow; cere light chrome, legs and feet light yellow, nails black. *b*. Female, April, "breeding." *c*. Immature. Iris cold brown, bill black, legs and feet light green-yellow, claws black.]

The immature bird is in brown and tawny dress, without any traces of white or deep chestnut.

8. Elanus hypoleucus (18).

[Cebu, male, March. Iris crimson, cere greenish yellow, gape yellow, bill black, feet light chrome, nails black. Snake and small mammal in the gizzard.]

Mr. Gurney has been good enough to compare this example with the type.

9. Butastur indicus (20).

[Cebu, female, March. Iris golden yellow, bill black, cere and base of bill deep chestnut, legs deep chrome-yellow, claws black.]

10. Scelostrix candida (27).

[Cebu, male, April. Iris dark brown, bill white, nails dark brown-grey.]

11. Merops bicolor (36).

[Cebu, male, April. Iris crimson, bill black, feet brown.]

In a series of ten examples, male and female, there is no trace of green mingled with the bright chestnut of the head, nape, and upper back. An example of a female ("breeding, April") is not distinguishable from examples of adult males.

12. Eurystomus orientalis (37).

Coracias orientalis, Linn. S. N. i. p. 154.

13. ALCEDO BENGALENSIS (38).

[Cebu, male, March.]

14. ENTOMOBIA GULARIS (44).

15. SAUROPATIS CHLORIS (47).

[Cebu, male, March. Iris brown, bill black, feet dark brown.]

16. XANTHOLÆMA ROSEA (51).

[Cebu, male, April. Iris hazel-brown, bill black, legs and feet coral-red.]

Identical with Javan, Sumatran (Lampong), and Negros individuals. Two examples, marked female by Mr. Everett, have many of the throat-feathers yellow, tipped with red. They are probably immature birds. This species is but a developed form of *X. hæmacephala*, the only distinction between the two being that the yellow eye-patches and the yellow throat of that species are blood-red in *X. rosea*. Their distribution is curious; for while *X. hæmacephala* occurs throughout the continent of India and the Indo-Chinese peninsula, and on the Philippine island of Luzon, *X. rosea* is restricted to Java and the two Philippine islands of Negros and Cebu, while Sumatra, again, is inhabited by both species.

17. MACROPTERYX COMATUS (52).

[Cebu, female, March.]

18. CENTROCOCCYX VIRIDIS (64).

[Cebu, female, April, "pairing." Iris crimson.]

19. LANIUS NASUTUS (70).

[Cebu, female, March, "breeding." Iris brown, bill and legs black.]

A numerous series of the Philippine black-headed Shrike in full dress, obtained in Cebu by Mr. Everett, together with my Luzon series, enables me, after comparison made with *Lanius nigriceps* (as restricted *l. c.*) of India, to assert the specific identity of the two species. The generality of the Philippine birds have the uropygium of a paler, more tawny ferruginous hue than Bengal (Rognathpoor) and Goomsoor examples; the grey tint descends lower down the back; and the ferruginous colouring of the flanks and under tail-coverts is of a paler, more dilute, shade. Still one Cebu individual is not to be distinguished from an adult Bengal individual in this or any other respect. Philippine birds exceed somewhat in dimensions. Adult Tonghoo birds belong more nearly to *L. tricolor*; but I have not as yet met with either Pegu, Assam, or Darjeeling examples in which the deep uniform ferruginous dorsal colouring of *L. tricolor* runs up and joins the black of the nape, as in Nipaul individuals.

The examples of females marked "breeding" by Mr. Everett have the head and nape dark ashy brown, rather than black.

20. Lanius lucionensis (72).

[Cebu, male, March and April; female, March.]

21. Artamus leucorhynus (73).

22. Graucalus striatus (74).

[Cebu, male, April. Iris fine deep crimson; bill, feet, and nails black. ♁. Female. Iris light claret-red.]

These Zebu birds do not differ from Luzon and Negros examples. Two, in dark plumbeous-grey plumage without pale edgings to any of the feathers, are marked male; two, dark plumbeous-grey above and banded with black on the whole under surface, are respectively noted as being male and female; a fifth example, uniform grey with the exception of the breast, abdomen, and crissum, which are banded with black, is marked male. The last example appears fully adult, and perhaps represents the dress of the adult female.

23. Volvocivora? cærulescens (75).

[Cebu, male, April. Iris dark brown, bill and legs black. ♁. Female, April, breeding, the same.]

Three males and as many females are in the collection. One of the males is in the pure black plumage of the adult; the other two have the black shaded with plumbeous. The females are dark plumbeous-grey, with darker margins to the dorsal plumes: one, an immature bird, has some of the secondary quills and some of the coverts margined with white. From the breeding female being in a plumbeous dress, we may infer that each sex in this species wears a peculiar adult garb. Luzon individuals do not differ from Zebu examples.

24. Lalage dominica (76).

[Cebu, male, April. Iris brown.]

25. Dicrurus mirabilis (81).

[Cebu, male, April. Iris crimson; bill and feet black.]

The dimensions of the single example obtained are somewhat smaller than those of typical individuals. Not hitherto recorded from Zebu.

26. Leucocerca nigritorquis (83).

[Cebu, male and female, March. Iris brown, bill and legs black.]

27. Cyornis philippinensis.

"*Cyornis banyumas* (Horsf.)," Walden, *l. c.* no. 84 (*nec* Horsf.).
Cyornis philippinensis, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 325.

[Cebu, male, April.]

The blue plumage of this single example is not of quite so dark a shade as that of Dr. B. Meyer's specimen (*l. c.*). Yet it is perceptibly darker than that of Luzon and Panay individuals. The length of the wings and tail is also slightly greater; but without a larger series for comparison it is best to retain it under the title cited.

28. Hypothymis azurea (85).

29. Hirundo javanica.

Hirundo javanica, Sparrman, Mus. Carls. t. 100.

[Cebu, male, April.]
New to the Philippines.

30. Broderipus acrorhynchus (90).

Oriolus acrorhynchus, Vigors, P. Z. S. 1831, p. 97.
Oriolus chinensis, Linn., apud Sharpe, B. M. Cat. Birds, iii. p. 203. no. 12, nec Linn.

Mr. Sharpe has recently (*l. c.*) adopted the Linnean title *chinensis* for this purely Philippine species, for the reason that that title is "undoubtedly referable to the Oriole of the Philippines" (*l. c.* p. 197, *note*). Linnæus gave the name to Brisson's *Loriot de la Cochinchine* (Orn. ii. p. 326); and Brisson states that the subjects of his description were brought to Réaumur by Poivre from Cochin China. Judging from the description, also, Brisson's bird could not have belonged to the Philippine species; for he describes it as possessing a yellow alar speculum, which the continental form has, and the Philippine bird lacks. After saying that the wing-feathers are black, Brisson adds "quelques-unes des moyennes sont terminées par une petite tache jaunâtre." It is therefore not necessary to adopt so inappropriate a title as *chinensis* for the Philippine Oriole; and the name *O. diffusus*, Sharpe (*l. c.*), for the continental species must be suppressed (*cf.* Walden, Blyth, B. Burma, no. 483). M. Oustalet (Ois. de la Chine, p. 132) correctly identified the Chinese *Broderipus* with the Brissonian species, and adopted the Brissonian title of *cochinsinensis*, but afterwards somewhat hastily accepted Mr. Sharpe's view, and placed that title in the list of errata and addenda.

31. Oriolus assimilis, n. s. (Plate LXXVI.)

[Cebu, male, March. Iris crimson, bill dull burnt-sienna brown, legs dark lead-grey, nails black.]

Male. Above and under tail-coverts dark greenish yellow; space before the eye, cheeks, ear-coverts, chin, throat, and breast dark grey, the breast being tinged with greenish yellow; abdomen, flanks, and ventral region grey or white, with broad almost black mesial bands; axillaries, under-surface of quills, and under wing-coverts grey; all the quills and major coverts above very dark grey, almost black, each washed with a pale grey on the outer webs, the wing, when closed, appearing dark grey. Tertiaries nearest the body distinctly tinged with greenish yellow. Minor wing-coverts like the back. All the rectrices above dark iron-grey, almost black. Outer pair with a pure yellow small terminal spot or mark at the apex of the inner web; all the others with slight indications of a terminal yellow margin.

Wing 4·87, tail 4·12, tarsus 0·88, culmen 1·25.

A representative form of *O. steerii*, ex Negros. Mr. Sharpe, who

has kindly compared it with the type of *O. steerii* in the British Museum, considers "that it is distinct from the Negros Oriole, and that it differs in having the greater wing-coverts grey and not yellow, and in having the spots on the tail-feathers so very small; the grey on the breast comes much lower down."

32. MEGALURUS RUFICEPS.

Megalurus ruficeps, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 94.

[Cebu, male, March. Iris dull burnt-sienna brown.]

Identical with the Luzon types. The sexes do not appear to differ in dimensions.

33. HYPSIPETES PHILIPPENSIS (102).

[Cebu, male and female, March. Iris burnt-sienna brown, bill brownish black, legs brown.]

34. PHYLLORNIS FLAVIPENNIS, n. s. (Plate LXXVII. fig. 1.)

[Cebu, male, April. Iris hazel, bill lead-grey, yellowish along the margin, legs and feet greenish leaden.]

The colours of the soft parts of the female are noted by Mr. Everett to be like those of the male, excepting that the yellowish commissure is not mentioned.

Male. Grass-green above, pale verditer-green underneath. Lores, chin, throat, and thigh-coverts yellowish green. Primaries brown on their inner webs, tinged with dark green along the shaft; outer webs of first three primaries green tinged with yellow; lower half of the outer webs of remaining primaries margined with yellow. Inner margin of all the quills, seen from below, yellow. The female like the male, but the colouring not altogether so bright.

Wing 3·75, tail 3·50, tarsus 0·80, culmen 0·87.

If the four examples sent by Mr. Everett have the sex correctly noted (of which there is little doubt), and if the males are in mature plumage (and there are no indications of immaturity), the sexes in this species do not essentially differ. There is no trace of any blue in the plumage of the males.

35. PRATINCOLA CAPRATA (104).

[Cebu, male, March and April. Iris brown, bill and legs black.]

36. COPSYCHUS MINDANENSIS (106).

37. PHYLLOSCOPUS BOREALIS.

Phyllopneuste borealis, Blasius, Naumannia, 1858, p. 313.
Phylloscopus magnirostris, Blyth, Walden, *l. c.* no. 109.

[Cebu, male and female, April.]

38. CALOBATES MELANOPE (115).

[Cebu, male and female, March.]

39. Corydalla lugubris (117).

[Cebu, male, April. Iris brown, maxilla brown, mandible pale ochreous, legs and feet light ochreous.]

40. Parus elegans (118).

[Cebu, male, April. Iris brown, bill dark, legs and feet lead-blue.]

Not separable from Luzon examples.

41. Dendrophila œnochlamys.

Dendrophila œnochlamys, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 338 t. liii. f. 2 (1876).

[Cebu, male and female, April. Iris orange-yellow, bill greenish yellow].

The male example has all the rectrices broadly tipped with the vinaceous colour of the breast. In the female the middle pair are throughout blue, while the laterals only exhibit a vinaceous tinge at their apices.

42. Zosterops everetti, n. sp.

[Cebu, male and female, April. Iris light yellow-brown, maxilla blackish, mandible and legs pale grey].

Male and female.—Above oil-green, darker than in *Z. palpebrosus*, and much darker than in *Z. meyeri* of Luzon. Narrow frontal band and lores, chin, throat, under tail-coverts, and shoulder-edge bright yellow. Below the eye a distinct black mark. Breast and flanks pale but decided iron-grey. Mesial band of abdomen, extending to vent, bright yellow. Rectrices above pale brown washed with oil-green.

Wings 2·06, tail 1·87, tarsus 0·70, culmen 0·50.

This species, closely allied to *Z. lateralis*, is to be distinguished by its green rectrices.

43. Prionochilus quadricolor, n. sp. (Plate LXXVII. fig. 2.)

[Cebu, April. Iris dark brown; legs, bill, and feet glossy black.]

The sex is not stated on the label.

Chin, throat, cheeks, sides of neck, breast, flanks, under wing-coverts, axillaries, abdomen and under tail-coverts pale greyish silky white, the chin, cheeks, and axillaries being almost pure white. Forehead, sides of head, vertex, and occiput, descending low down the nape, dull black. Interscapulars and back black, broadly tipped with cinnabar-red. Uropygium black with olive-yellow tips to the feathers. Upper tail-coverts, rectrices, and wing-coverts rather glossy bluish black. Quills dark blackish brown.

Wings 2·12, tail 1·25, tarsus 0·50, culmen 0·37.

This is one of the most important additions made by Mr. Everett to the Philippine fauna, adding, as it does, one of the hitherto missing characteristic Malayan genera; for, although Mr. Sharpe (*t. c.*) in-

cludes *Prionochilus* amongst the Philippine genera, it is only on the strength of a Palawan example of the genus.

44. Dicæum rubriventre (120 partim).

Pipra papuensis, Gm. S. N. i. p. 1004.
Dicæum rubriventer, Lesson, Tr. p. 303.
Dicæum retrocinctum, female, Gould, B. As. xxvii. t.—; cf. Salvad. Ann. Mus. Civ. Gen. viii. p. 509.

[Cebu, male, April.]

This example, in the plumage of *D. retrocinctum*, female, apud Gould, is also marked a male, like the one obtained in Cebu by Meyer (*l. c.*) and by Mr. Everett (*antea*, p. 698) in Luzon. Count Salvadori's view (*l. c.*) that it is not the female of *D. retrocinctum*, Gould, but a distinct species, is therefore confirmed. I am further inclined to the opinion that *D. retrocinctum*, if from either island, is from Mindanao and not from Luzon, and that Sonnerat obtained the type of *P. papuensis* in Luzon and not in Mindanao.

45. Dicæum dorsale.

Dicæum dorsale, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 340.

[Cebu, male, April. Iris brown.]

46. Arachnechthra jugularis (123).

[Cebu, male. Iris brown, bill and legs black.]

47. Æthopyga magnifica.

Æthopyga magnifica, Sharpe, 'Nature,' August 1876, p. 297, "Negros;" Tr. L. S. ser. 2, Zool. i. p. 342; Shelley, Cinnyridæ, pt. iii. t.

[Cebu, male, April. Iris brown, bill and legs very dark brown, the mandible dark brown.]

48. Anthothreptes chlorogastra?

Anthreptes chlorogastra, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 342.

[Cebu, male, April.]

A single example of the genus was obtained by Mr. Everett; but as it represents a young male before it has assumed its metallic plumage, it is impossible to identify it with any certainty. One or two violet scapulars are present; and one of the occipital feathers is also violet. In *A. chlorogastra* the head is said to be metallic green.

49. Corvus philippinus (125).

[Cebu, male, March. Iris brown, bill and legs black.]

50. Calornis panayensis (128).

[Cebu, male and female, April. Iris vermilion-red, bill and feet black.]

51. Sarcops calvus (129).

[Cebu, male, April. Iris brown, bare skin dull carmine, bill and legs black.]

52. Oxycerca everetti.

Oxycerca everetti, Tweeddale, Ann. & Mag. N. Hist. ser. 4, vol. xx. p. 96.

[Cebu, male, March. Iris brown, bill black, mandible grey, legs dark grey.]

Not separable from Luzon examples. Sexes alike.

53. Munia jagori (132).

[Cebu, male, March. Iris brown, bill pale grey, legs dark grey.]

In Mr. Everett's examples (male and female) the black mesial band is not confluent with the black of the breast. The species is very similar to *M. rubrinigra*, but has the black on the abdomen more fully developed.

54. Osmotreron vernans (135).

[Cebu, male, April. Iris, inner ring light blue, outer ring light ochreous; bill lead-grey, cere green, feet carmine, nails grey.]

55. Osmotreron axillaris (136).

[Cebu, male, April. Iris light blue-green. *b*. Female. Iris blue-green; bill lead-grey, base dark-red; feet greenish grey, nails grey.]

In the adult female the cap is pure grey as in male. In the younger female the crown is dingy green.

56. Ramphiculus occipitalis (138).

[Cebu, male and female, April. Iris, pale reddish-brown (female light yellow-brown). Basal half of bill vermilion, apical half yellow; feet carmine, nails grey tinged yellow.]

Neither in plumage nor dimensions do the sexes differ. Zebu examples cannot be separated from Luzon individuals.

57. Phabotreron nigrorum.

Phabotreron nigrorum, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 346.

Phabotreron leucotis (Temm.), Walden and Layard, Ibis, 1872, p. 104, ex Negros.

[Cebu, male and female, April. Iris brown, bill black, legs and feet bright carmine, nails grey.]

The characters whereby Mr. Sharpe separated the Negros form of this genus from the nearly allied *P. leucotis* of Luzon belong also to the Guimaras and the Zebu birds.

58. Carpophaga ænea (141).

[Cebu, male, March. Iris and orbital ring bright crimson, bill lead-grey, feet dull purplish-crimson.]

A series of four Cebu individuals cannot be differentiated from Luzon and Negros specimens.

59. Turtur dussumieri (147).

60. Chalcophaps indica (150).

[Cebu, male and female, April. Iris brown, bill orange-red, legs dark red, feet dull carmine.]

61. Turnix nigrescens, n. sp.

[Cebu, female, April. Iris yellowish white, bill chrome-yellow, legs chrome-yellow, feet tinged with green.]

While *T. fasciata* of Luzon chiefly differs from *T. pugnax*, ex Java, in its smaller dimensions and its broad uniform rufous nape, this Zebu bird somewhat exceeds *T. pugnax* in size, and is readily differentiated by the ground-colour of the crown, back, and uropygium being blackish brown instead of rufous. Like *T. fasciata* it also possesses a broad rufous nuchal collar.

	Dimensions.			
	Wing.	Culmen.	Tarsus.	
	in.	in.	in.	
T. pugnax ♀	3·37	0·68	1·06	*ex* Java. Throat black.
„ „ ♂	3·06	0·62	0·95	
T. fasciata ♀	3·00	0·62	0·83	*ex* Luzon. „
„ „ ♂	2·86	0·50	0·75	
T. nigrescens ♀	3·50	0·75	1·12	*ex* Zebu. „
„ „ ♂	3·12	0·63	0·95	

62. Megapodius pusillus, n. sp. (Plate LXXVIII.)

[Cebu, male, March. Iris dark hazel, bill dark brown, legs very dark brown, nearly black.]

The upper surface rich ruddy yellowish (almost golden) brown. Uropygium and upper tail-coverts and rectrices brown. Chin and throat dirty yellowish brown, the feathers being light grey at their insertion. Neck and upper breast slate-grey tipped with ruddy brown. Lower breast, abdomen, and flanks slate-grey, but faintly washed with ruddy brown. Ventral region paler grey tinged with ochreous brown. Thigh-coverts distinct ruddy, almost rusty, brown. Under tail-coverts dull ashy brown. Primaries uniform brown. Secondaries margined externally with the hue of the back. Tertiaries and wing-coverts like the back. Sides of head and forehead slightly paler than the head.

Wing 6·25, tarsus 1·70, middle toe without claw 1, culmen 0·64.

This small Megapode has the ophthalmic region, throat, and neck densely clothed, and belongs to a type different from *M. cumingi*.

Mr. Sharpe has lately (P. Z. S. 1875, p. 111) separated the Bornean Megapode from the then only known Philippine species, and given the title of *M. lowii* to the Bornean (Labuan) species. That

the Philippine and Bornean naked-faced Megapodes differ specifically seems to be established; but it would appear that the Philippine and not the Bornean species requires a new title. Mr. Sharpe proceeds on the assumption that Mr. Dillwyn described from and bestowed the title of *M. cumingi* (P. Z. S. 1851, p. 119, t. xxxix.) on Cuming's Philippine (Manila?) examples. But neither the context nor the descriptions and dimensions, the last on Mr. Sharpe's own showing, appear to support his conclusion. Mr. Dillwyn (*l. c.*) considered the Labuan Megapode to belong to the same species as that sent by Mr. Cuming to the British Museum from the Philippines; and the point of difficulty is whether Mr. Dillwyn described (*l. c.*) his *M. cumingi* from Motley's Bornean examples or from Cuming's Philippine specimens. Mr. Dillwyn described his type as being "blackish slate-colour" below, and he figured the bird (*l. c.*) dark (blackish) slate-colour below. Mr. Sharpe, when differentiating the Bornean from the Philippine Megapode, says (*l. c.*) that the Labuan specimens sent to the British Museum by Mr. Lowe are smaller and darker than the Philippine birds, especially on the breast, which is deep plumbeous grey, whereas in the Philippine bird the under surface is brownish washed with grey. If we compare the dimensions given by Mr. Dillwyn of his type of *M. cumingi* with those given by Mr. Sharpe (*l. c.*) of his *M. lowii* (ex Labuan) and of the Philippine bird, it will be found that the principal dimensions of Mr. Dillwyn's type of *M. cumingi* and of Mr. Sharpe's type of *M. lowii* are essentially the same, while the dimensions of the Philippine Megapodes are sensibly larger.

	Total length.	Wing.	Tail.	Tarsus.
	in.	in.	in.	in.
M. cumingi, Dillwyn (*l. c.*)	14·0	8·6	3·0	2·1
M. lowii, Sharpe (*l. c.*), ex Labuan ...	14·5	8·1	3·1	2·4
M. cumingii, Dillwyn apud Sharpe (*l. c.*), ex Philippines	16·0	10·0	3·7	2·5

Mr. Sharpe states that the Labuan birds differ from the Philippine in being smaller, and he admits that the plate (*l. c.*) of *M. cumingi* represents the Bornean Megapode, and yet he assumes that Mr. Dillwyn described from Cuming's Philippine individuals. As I first drew attention (T. Z. S. ix. p. 225) to the desirability of recomparing the Philippine Megapode with the Bornean *M. cumingi*, and as Mr. Sharpe after making the comparison asserts that they differ specically, I propose the title of *Megapodius dillwyni* for the Philippine species obtained by Cuming[1].

[1] Since I arrived at this conclusion Mr. Dillwyn has kindly written to me to say, respecting the *M. cumingi* described by him in the P. Z. S. (and also in his Nat. Hist. Labuan), the description was from a specimen which he received from Motley from Labuan. Wolf's figure was taken from the same specimen.

63. Charadrius fulvus (159).

[Cebu, male and female, April.]

Two of the male examples are in almost full breeding-plumage, a few only of the chin- and throat-feathers not being black.

64. Gallinula chloropus (169).

[Cebu, female, juv., March. Iris crimson, bill dirty orange-yellow, brown at the base, legs grass-green, nails brown. *b*. Cebu, female, April. Iris crimson, bill light brown, apical portion light greenish, legs green.]

65. Ortygometra cinerea (172).

[Cebu, male, March. Iris crimson, bill greenish brown, legs dull greenish, nails brown. *b*. Cebu, female, March. Iris crimson, maxilla greenish brown, mandible green, legs dull greenish, nails brown.]

66. Rallina euryzonoides.

The Rail, Brown, Illustr. p. 94, t. xxxvii., "Ceylon" (1776).

Gallinula eurizonoides, Lafresn. Rev. Zool. 1845, p. 368.

Rallus zeylanicus, Gm. S. N. i. p. 716. no. 17; Jerdon, B. Ind. iii. p. 725, nec Gm.

Rallus zeylanicus, Gm., *l. c.* auctt. recent. nec Gm.

[Cebu, male, April. Iris brilliant red. *b*. Cebu, female, April. Iris bright brick-red, bill blackish, the base tinged light green, tip greyish, legs dull greenish leaden, feet dark lead-grey, nails grey.]

The two examples obtained by Mr. Everett do not quite agree with Ceylon and Continental-Indian individuals, inasmuch as the dark banding below appears much blacker, broader, and more decided, and the dorsal colouring is browner. Still, since it is impossible to select any marked characteristic difference, and as this Rail is probably a migrant, as in Ceylon, I refer these Philippine birds to the Indian species. Mr. Blyth was of opinion that the race found in the Philippines was barely distinguishable (Jerd. *l. c.*).

Brown (*l. c.*) described and figured, under the title of *The Rail*, this species from a Ceylonese example obtained by Governor Loten. At p. 96 he also described, and on plate xxxviii. he figured, a distinct bird from the same source under the title of *Rail*. Gmelin (*l. c.*) copied Brown's description of his *Rail*, and bestowed on it the title of *Rallus zeylanicus*. But Gmelin, while correctly quoting p. 96 of the Illustrations, incorrectly referred to plate xxxvii., on which is depicted Brown's *The Rail*. On Brown's description of *The Rail* Gmelin founded no title; but when incorporating the Linnæan species *Rallus capensis* (Mantissa, p. 525) in his edition of the 'Systema' (*l. c.* No. 11) and more or less transcribing the Linnæan diagnosis, he followed Latham (Synop. iii. pt. i. p. 234. no. 8) and referred the Linnæan bird to the one described by Brown at p. 94 as well as to the one figured by Brown on plate xxxviii. Latham made the identification with a note of interrogation. Gmelin in both cases associated the wrong plate with the pages containing Brown's descrip-

tive remarks, and called both species *Rail*. As Gmelin's diagnosis of his *Rallus zeylanicus* does not apply to the ferruginous-breasted Rail of Ceylon, *The Rail* of Brown, we must adopt the next title, that of Lafresnaye. I cannot with certainty identify the bird described and figured by Brown under his title of Rail (*Rallus zeylanicus*, Gm.); but it is apparently a gallinaceous bird—possibly *Galloperdix spadiceus* (Gm.).

67. Amaurornis olivacea (176).

[Cebu, male, March. Iris crimson, bill dark green, paler at tip, legs yellow-brown. *b*. Cebu, female, March. Iris crimson, bill grass-green, legs and feet brownish dull yellow.]

68. Hypotænidia torquata (177).

[Cebu, male and female, March. Iris crimson, feet and nails lead-grey, bill black.]

The series sent consists of thirteen examples of both sexes, some being from Luzon. In plumage the males do not differ from the females. Every variety occurs in the colouring and extent of the pectoral band, which is dark pure maroon in the full plumage.

69. Hypotænidia striata (179).

Hypotænidia obscuriora, Hume, Str. F. 1874 (January), p. 302, "Andamans."

Hypotænidia ferrea, Walden, Ibis, 1874, April, p. 147, "Andamans."

[Cebu, male, March. Iris burnt-sienna brown, bill blackish brown, base carmine, legs greyish brown. *b*. Cebu, male, April. Iris Indian red; bill purplish brown, base dull crimson; legs brown.]

These Zebu specimens may be regarded as being typical; and from them Andaman and Rangoon examples cannot be separated; consequently the titles founded on the Andaman race must fall. A recomparison made with Continental-Indian and Malaccan examples does not support my former (*l. c.*) opinion that the Andaman birds specifically differ from Indian and Malaccan; otherwise the Indian race would require a new title.

70. Tringoides hypoleucus (183).

[Cebu, male, April. Iris brown, bill dark brown, legs light greenish-grey, nails black.]

71. Totanus incanus.

Scolopax incanus, Gm. S. N. i. p. 658.

[Cebu, female, April. Iris dark brown, bill very dark brown, legs ochreous yellow, nails black.]

Wings 6·50. Breeding-dress.

72. Gallinago megala (188).

[Cebu, female, April.]

73. Butorides javanica (197).

[Cebu, March. Iris golden yellow, orbital and loral regions light green, bill black, base of mandible yellowish, legs and feet dull green, nails grey-black.]

74. Nycticorax manillensis (198).

[Zebu, male, May. Iris golden-yellow, bill brown, mandible dirty yellow, legs light greenish-yellow, nails grey.]

The male of which the soft parts are described above is a young bird. Above the plumage is rich dark brown, each feather centred for its entire length (as on the neck) or for its terminal half (as on the back) with clear ferruginous. Underneath the plumage has the same character; but the ferruginous colour is diluted, and on the breast tawny. The quills are of the same rich dark chestnut-colour that prevails in the adult. Chin and throat pure white. The crown of the head is like the neck, and not black as in the adult. Many of the frontal and coronal feathers have prolonged, twisted or partly curled terminal naked shafts of a yellowish albescent colour and over half an inch in length. This occurs in two specimens.

An example (without a label) in almost full dress, has the forehead, crown, and occipital crest black. The remainder of the upper plumage and the exposed surfaces of the wings are rich dark chestnut-rufous, darkest on the interscapular region. The chin and throat pure white, with a few feathers tipped and centred brown. The sides of the head, the sides and front of the neck, upper breast, and flanks pale rufous tawny with broad ruddy-brown margins. Lower breast and abdomen white and tawny-white with the brown margins narrower. Under tail-coverts white, some blotched with creamy rufous. Long axillaries pale pure rufous. Carpal edge pure white. Culmen 2·87 inches, tarsus 3·75, wing 12·75.

The long, pendent, white nuchal plumes are absent, the black tips of which are said to be one of the characters which differentiate *N. manillensis* from *N. caledonicus*. The differences between the two species are otherwise well marked; but Professor Schlegel's opinion that *N. manillensis* = *N. crassirostris*, ex Bonin Ins., requires confirmation.

The bill of this Philippine example is thicker than in *N. caledonicus*, (ad. ex Port Albany), measuring in altitude 1 inch as against 0·75.

75. Dendrocygna vagans (203).

[Cebu, male, March. Iris dark brown, bill shining black, legs and feet dark slate-grey. *b*. Cebu, male, April.]

The example shot in March is in almost full plumage, the secondaries being well developed. Most of the breast-feathers have one or two pairs of brown spots. The second example, shot in April, is of smaller dimensions, the secondaries shortened, the breast-plumage uniform.

2. On a Collection of Birds from Eua, Friendly Islands. By Dr. Otto Finsch, C.M.Z.S., Director of the Museum of Natural History of Bremen.

[Received Sept. 26, 1877.]

The Island Eua (Eooa, Eoa, Eaowe or Eaoowe), belonging to the Tonga or Friendly group, situated to the south-east of the main island Tongatabu, is much smaller than the latter, but, instead of being flat, shows a more mountainous appearance, and rises to a height of about 600 feet above the level of the sea.

When writing our 'Ornithology of Central Polynesia,' ten years ago, Dr. Hartlaub and I were, as regards the birds of the Tonga group, obliged nearly to confine ourselves to what Forster had written on the subject, Tonga birds being at that time of the greatest rarity in collections. The total number of species then known of Tonga birds was 33, of which only four were known from Eua (viz. *Platycercus tabuensis*, *Ptilotis carunculata*, *Carpophaga pacifica*, and *Gygis alba*). Since that time we have had the pleasure of publishing a welcome contribution to our knowledge of the Tonga birds, based upon the collections of Dr. Gräffe[1], which reached us through the Museum Godeffroy, of Hamburg, in 1869. A very interesting account of the habits of Tonga birds was shortly after published by Dr. Gräffe[2] himself, which paper may be considered a valuable continuation of our memoirs. Dr. Gräffe noticed, as observed by himself, 26 species (of which 18 were collected by him and examined by us), thus adding 5 species to the avifauna, among which one proved to be new (*Colluricincla heinei*, nob.), and raising the total to 38. Since then Mr. E. L. Layard has visited the Tonga group and has published a useful contribution[3], which adds, as observed by him, 7 species more (*Limosa uropygialis*, *Strepsilas interpres*, *Sterna melanauchen*, *St. panaya*, *Anous leucocapillus*, *Phaëton candidus*, and *Tachypetes aquila*), and raises the total of alleged species to 45. But as some of these occurrences rest on antiquated statements, not yet confirmed, the total number known with certainty from the whole group remains still 37.

I have now to make a further addition to our knowledge of this avifauna. Mr. F. Hübner, at the charge of the Museum Godeffroy in Hamburg, has lately again visited the Tongas, and has sent over a collection made on the island of Eua. His exertions have raised the number of birds known to occur on this island from 4 to 24.

[1] Dr. O. Finsch and Dr. G. Hartlaub "On a small Collection of Birds from the Tonga Islands," in P. Z. S. 1869, pp. 544–548, and Dr. O. Finsch u. Dr. G. Hartlaub "Zur Ornithologie der Tonga-Inseln," in Cabanis's Journal für Ornithologie, 1870, pp. 119–140, Taf. iv.

[2] Dr. Eduard Gräffe, "Ornithologische Mittheilungen aus Central-Polynesien. I. Die Vogelwelt der Tonga-Inseln," in Cabanis's Journal für Ornithologie, 1870, pp. 401–420.

[3] E. L. Layard, "Notes on the Birds of the Navigators' and Friendly Islands, with some Additions to the Ornithology of Fiji," in P. Z. S. 1876, pp. 490–506.

Of these, examples of 21 have been inspected by me; two (*Charadrius fulvus* and *Limosa uropygialis*) I included on Mr. Layard's authority. Only one species, the Parrot *Platycercus tabuensis*, seems to be peculiar to the island.

1. STRIX DELICATULA.

Strix delicatula, Gould; Finsch & Hartl. P. Z. S. 1869, p. 545, et Journ. f. Ornith. 1870, p. 122.

Native name *Lulu* (Hübner, Gräffe).

One female from Eua, exactly resembling specimens from Feejee. "Contents of stomach, hairs of bats" (Hübner).

Mr. Hübner observed this species also in the Hapai group, north of Tongataboo.

2. PLATYCERCUS TABUENSIS.

Platycercus tabuensis (Gm.); Finsch, Papag. ii. p. 231; F. & H. Journ. f. Orn. 1870, p. 123; Layard, P. Z. S. 1876, p. 500.

Native name *Kaka* (Hübner, Gräffe).

Nine specimens (collected in August 1876), all from Eua.

The absence of red tips to the feathers of the lower rump or upper row of upper tail-coverts, as I have already remarked, is not a character of specific value in this bird. In the series before me there is only a single specimen which has the uropygium uniform green; the others all show more or less red tips to the feathers, which in some are broad and very conspicuous; in two, also, the lesser and largest scapula-coverts have purplish-red tips. The extent and width of the blue neck-collar also varies individually; generally it is broad and well defined, but in some examples is so narrow and obscure that it nearly disappears.

According to Dr. Gräffe this species is confined to the island Eua; but Mr. Layard suggests that the bird has been introduced there from Fiji.

Mr. F. Hübner writes on this species (*in litt.*):—"Notwithstanding my utmost endeavours, I was not able to obtain certain information with respect to the breeding-time of the 'Kaka.' All the holes in the trees which I inspected were uninhabited; and even the natives could not tell me where eggs were to be found. But as I obtained young birds in August I am inclined to believe that June and July are the season of incubation, although females shot by me in these months did not show any development of the ovaries. In habits the Kaka does not differ from other Parrots; it feeds on berries and fruits. The male and female are alike, except that the latter has a weaker bill. The young ones are obscure in colour, but they soon get the bright dress of the old; the iris of the latter is orange, in the young grey-brown."

In my work on the Parrots I gave, on the authority of Peale, also the Fiji Islands as the locality for this species, considering *Pl. atrogularis*, Peale, and *Pl. annæ*, Bourj., to be identical. This I now believe was a mistake, as also my statement that Peale had

erroneously given the Fijis as a locality. It is true that all the specimens I have seen from the islands of Viti-Levu, Vanua-Levu, Loma-Loma, and Kandavu belong to the much more brightly coloured *P. splendens*; but through Mr. Layard we now learn that the island of Taviuni possesses another bird which shows the same dark purplish-red colour (*atro-purpureus*) as *P. tabuensis*. A specimen from Taviuni before me differs, not only in the smaller size, but also in the total absence of the blue neck-collar, of which not even the slightest trace is visible. But I hesitate to declare this difference of specific value, as Cassin mentions in *P. atrogularis* a broad, in *P. annæ* a narrow blue collar; and as both these birds were collected on the Fijis, although without exact locality, they evidently belong to one and the same species.

The dimensions of 20 specimens of *P. tabuensis* from Eua are as follows,

Wings.				Tail.			
in.	lin.	in.	lin.	in.	lin.	in.	lin.
8	3	9	8	7	8	9	3

whereas in the Taviuni bird the wings measure only 7″ 8‴, the tail 6″ 8‴.

If the smaller size of the Fiji bird should turn out to be constant, it ought to be regarded as a different species, to which belong the three dark races pointed out by Mr. Layard[1] as differing in the extent of the blue collar. The synonymy of this Fiji form of *P. tabuensis* will be as follows :—

PLATYCERCUS ANNÆ.

Conurus anna, Bourj. Perr. t. 38.

? *Platycercus tabuensis*, Jard. & Selb. Ill. of Ornith. ii. pl. lxxiv. (fig. pess., without blue collar).

Pl. atrogularis, Peale, Unit.-St. Expl. Exped. (1848) p. 129, pl. xxxv.; Hartl. Wiegm. Arch. 1852, p. 106.

Aprosmictus tabuensis et *A. anna*, Cass. Un.-St. Expl. Exp. 2nd edit. (1858) pp. 234, 236.

Pl. anna, Gray, List Psitt. p. 11.

Pl. atrigularis, Scl. P. Z. S. 1864, p. 158.

Pl. tabuensis, Gough, P. Z. S. 1849, p. 14; Finsch, Mon. Papag. ii. p. 231 (upper part).

Pl. taviunensis, Layard, Ibis, 1876, p. 141, et *Pl. splendens*, second race (from Mathuata), third race (from Koro), and fourth race (*taviunensis*, from Taviuni), *ib.* p. 143.

3. DOMICELLA FRINGILLACEA.

Domicella fringillacea (Gm.); Finsch, Papag. ii. 747; Layard, P. Z. S. 1876, p. 501.

Native name *Hega* (Hübner, Gräffe).

Three specimens from Eua. Sexes alike. No difference is observable in specimens from the Navigators' and Wallis Islands. One specimen shows the green front stained with bluish.

[1] Ibis, 1876, p. 141.

This species has been observed also by Mr. Hübner in the Hapai group and on Vavao.

4. EUDYNAMIS TAITIENSIS.

Eudynamis taitiensis (Sparrm.).
Native names *Kaliva* (Hübner), *Haleva* (Gräffe).

One male in the spotted dress of the young bird from Eua (August 1876). This is the first specimen of this bird I have examined from the Friendly group; its occurrence there has been stated already by G. R. Gray and Dr. Gräffe.

5. HALCYON SACRA (Gm.).

Native name *Gikota* (Hübner, Gräffe).

Five specimens. The remarks given, Journ. f. Ornith. 1870, p. 124, are also applicable to the series before me. Generally the specimens with a tawny-coloured eye-stripe (running round the nape) show also narrow edgings of the same colour on the upper wing-coverts; but these are sometimes also present in white-eye-striped specimens.

This species occurs also in the Hapai group (*Hübner*, in litt.).

6. PTILOTIS CARUNCULATA.

Ptilotis carunculata (Gm.); F. & Hartl. P. Z. S. 1869, p. 545; iid. Journ. f. Orn. 1870, p. 125; Gräffe, ib. p. 404 (habits); Layard, P. Z. S. 1876, pp. 491 et 501.
Native names *Fuleheu* (Hübner, Gräffe); *Fule-haio* (Layard).

Three specimens from Eua, agreeing exactly with others from the Navigators' and Viti. Of the latter I have before me two specimens from Matuka, collected during the 'Challenger' Expedition. (See above, p. 732.)

7. COLLURICINCLA HEINEI.

Myiolestes heinei, F. & H., P. Z. S. 1869, p. 546, et Journ. f. Ornith. 1870, p. 126, t. iv.
Native name *Fuiva* (Hübner, Gräffe).

Two specimens from Eua, exactly like those from Tongatabu and Vavao.

"This species is common and lives in the brush" (Hübner).

As it appears that the genus *Myiolestes* of Cabanis (Mus. Hein. p. 67) was based on *Muscicapa obscura*, Horsf. (= *hirundinacea*, Temm. Pl. Col. 119), from Java, a bird which is quite different generically, this Polynesian bird may be placed in the genus *Colluricincla*, from which it, in my opinion, does not differ generically.

8. LALAGE MACULOSA (Peale); Finsch, P. Z. S. 1877, p. 724.

L. terat, Layard, P. Z. S. 1876, p. 502.
Native names *Gikiviu* (Hübner); *Singiviu* (Layard).

Two specimens from Eua. One of them, nearly in full plumage,

has narrow rusty borders on the feathers of the vertex, also on those of the back; but these are more obsolete; the middle wing-coverts are white, tinged with pale rusty and with a black median streak. This is seen only on the right wing; on the left the white patch is nearly fully developed.

The second specimen is an interesting albino variety. All the parts which in the adult male are black are in this specimen pale tawny; the middle tail-feathers are brown, the rest of them pure white; bill and feet horn-colour.

9. Aplonis tabuensis (Gm.).

A. marginata, Gould; Cass. Expl. Exp. pl. 30. f. 1.
Lamprotornis fusca, Peale (part).
A. cassini, Gray (part).
Native name *Megi* (Hübner).

Two specimens, male and female (exactly alike), from Eua. Mr. Hübner found this species breeding in the hole of a tree. According to him it occurs also on the Hapai group.

In our 'Ornithology of Central Polynesia' (p. 103), and later (Journ. f. Ornith. 1870, p. 131), we have followed Peale in stating the *Aplonis* from the Tonga and Viti group to belong to one and the same species, *i. e. A. tabuensis* (Gm.). A close examination convinces me, however, that they are not identical, but of two distinct species. The true *A. tabuensis*, which seems to be confined to the Tonga group (Eua, Tongatabu), is generally darker; and the underparts are dirty brownish-grey, with obsolete whitish stripes, which are caused by the light-coloured shafts on the breast and vent.

The dimensions do not give distinctive characters, although the Viti birds generally seem to be smaller.

Al.		Caud.		
in. lin.	in. lin.	in. lin.	in. lin.	
4 0	4 2	2 1	2 3	*tabuensis.*
3 8	4 0	2 1	2 3	*vitiensis.*

The Viti bird is generally lighter; the shafts of the feathers on the back and shoulders are whitish, and form very narrow striæ; the under surface is light brownish, streaked longitudinally with whitish, each feather being, along the shaft, broadly whitish, so that the white shaft itself remains inconspicuous, and does not form the narrow striation as in *A. tabuensis*.

The Viti bird, which must for the future be called *Aplonis vitiensis*, Layard[1], seems to be widely distributed on the Viti group: Ovalau (*Gräffe*), Vatu Lele (*Kleinschmidt*), Kandavu, Suva, Lomaloma, Taviuni (*Layard*).

Whether the *Aplonis* collected by Dr. Gräffe on the small island Uëa, Wallis group, belongs to this species or to *A. tabuensis*, I cannot say, not having seen specimens from that locality.

[1] Layard, P. Z. S. 1876, p. 502, = *A. tabuensis*, F. & Hartl. Ornith. Central-Polyn. p. 103, tab. x. f. 2, et Layard, P. Z. S. 1875, p. 435.

10. PTILINOPUS PORPHYRACEUS.

Ptilinopus porphyraceus (Forst.).
Native name *Kulukulu* (Hübner, Gräffe).

Two specimens from Eua; sexes alike.

On this peculiar species see Journ. f. Ornith. 1870, p. 131. It occurs also in the Hapai group (*Hübner*, in litt.).

11. CARPOPHAGA PACIFICA.

Carpophaga pacifica (Gm.); Layard, P. Z. S. 1876, p. 503.
Native names *Lube* (Hübner), *Oroobe* (Layard).

Two males from Eua (August), exactly like specimens from the Navigators'.

The distinctive characters between this Central-Polynesian species and the more western *C. oceanica*, Less. (of the Carolines and Palau group), I have pointed out in Journ. Mus. Godeffroy, Heft viii. 1875, p. 26.

12. CHARADRIUS FULVUS.

Charadrius fulvus, Gm.; Layard, P. Z. S. 1876, p. 503.

Mr. Layard found this species common on Eua (in February).

13. TOTANUS INCANUS.

Actitis incana (Gm.); Layard, P. Z. S. 1876, p. 503.
Native name *Kiu* (Hübner).

One female in full summer dress, from Eua, shot in August.

14. LIMOSA UROPYGIALIS.

Limosa uropygialis, Gould; Layard, P. Z. S. 1876, p. 503.

Not in the collection, but mentioned by Mr. Layard from Eua.

15. ARDEA SACRA.

Ardea sacra, Gm.; Layard, P. Z. S. 1876, p. 503.
Native name *Motuka* (Hübner).

One slate-blue specimen from Eua (August).

16. ? ORTYGOMETRA TABUENSIS.

? *Ortygometra tabuensis* (Gml.).

Mr. Hübner remarks that the *Moho*, as this species is called by the natives, "although formerly common, may be considered nearly extinct on Eua." According to Mr. Layard, the *Moho* would be *Monarcha nigra* (Sparrm.), which is now extinct (P. Z. S. 1876, p. 501).

17. PORPHYRIO SAMOËNSIS, Peale.

P. vitiensis, F. & Hartl. Ornith. Central-Polyn. p. 172; Layard, P. Z. S. 1876, p. 503.
Native name *Kalai* (Hübner).

One female from Eua (August), which agrees in every respect

with specimens from the Navigators'. On the Central-Polynesian *Porphyrio* and its synonymy, *cf.* Finsch, Journ. für Ornith. 1872, p. 55.

18. ANAS SUPERCILIOSA.

Anas superciliosa, Linn.; Layard, P. Z. S. 1876, p. 503.
Native name *Toloa* (Hübner).
One female from Eua (August).

19. STERNA BERGII.

Sterna bergii, Licht.; *Gygis*, sp.? Gräffe, Journ. f. Orn. 1870, p. 403.
Native name *Tola* (Hübner), *Tala* (Gräffe).
One specimen from Eua (August).
Since the time of Latham the occurrence of this species on the Tonga group has not been recorded; but Mr. Layard also gives evidence of its occurrence (P. Z. S. 1876, p. 503).

Al.		Caud. (exter.)		Rostr.	Altit.	Tars.	Dig. med.
in.	lin.	in.	lin.	lin.	lin.	lin.	lin.
13	3	5	7	25	7	$12\frac{1}{2}$	12

20. ANOUS STOLIDUS.

Anous stolidus, L.
Native name *Gogo* (Hübner).
One old and two young specimens from Eua (August); the latter have the head and neck of a uniform sooty-brown; but the feathers on the forehead and vertex are acquiring greyish-white tips, so that there can be no doubt that still younger birds are uniform sooty-brown (*A. rousseaui*, Hartl.).

Al.		Caud.		Rostr.	
in.	lin.	in.	lin.	lin.	
10	6	6	0	20	Ad.
10	3	5	2	17	Jun.

According to Mr. Hübner this species breeds on the rocks on the east side of Eua.

21. ANOUS ALBIVITTATUS.

Procelsterna albivitta, Bp. C. R. p. 773 (1856); Gould, Handb. B. Austr. ii. p. 420.
Native name *Lefulefu* (Hübner).
Two specimens, precisely alike, from Eua (August).
This species, new to the avifauna of Tonga and Central Polynesia, differs very strikingly from *A. cæruleus*, Bennett (*A. parvulus*, Gould, *A. cinereus*, Neboux, nec Gould), in the pale grey colour of upper parts and the delicate silvery greyish white of its head, neck, and underparts.

Al.		Caud.		Rostr.	Tars.	Dig. med.
in.	lin.	in.	lin.	lin.	lin.	lin.
6	9	3	4	11½	11	11
7	2	3	9	11½	11	11

Mr. Howard Saunders, in his Monograph of the Sterninæ (P. Z. S. 1876, p. 671, confounds this very distinct bird with *A. cinereus*, Neboux, which latter must, according to his views, bear the name *A. cæruleus*, Bennett.

22. GYGIS ALBA.

Gygis alba (Sparrm.); Layard, P. Z. S. 1876, p. 504.
Native name *Ekiaki* (Hübner).

One specimen from Eua (August) in the very interesting stage of the young-plumaged bird after leaving the nest. It is white; but the feathers on the upper parts have narrow edgings of pale rufous. This bird occurs also on Vavao (*Hübner*, in litt.). Mr. Layard found it common on Eua.

23. PHAËTON FLAVIROSTRIS.

Phaëton flavirostris, Brandt.; Layard, P. Z. S. 1876, p. 504.
Native name *Tavaki* (Hübner et Layard).

One old female from Eua (August).

Dr. Gräffe notices as "Tavaki" *Ph. æthereus* from Tonga (Journ. f. Orn. 1870, pp. 403 et 411).

Mr. Layard got the egg of this species on Eua.

24. DYSPORUS SULA.

Dysporus sula (L.), F. & H. Ornith. Central-Polyn. p. 260.
Diomedea, sp.? Gräffe, Journ. f. Ornith. 1870, pp. 403 et 411.
Native name *Gutulei* (Hübner).

One old male from Eua (August).

The "Gutulei" of natives, which Dr. Gräffe supposed to be a species of *Diomedea*, turns out to be the well-known Booby of the sailors.

3. On the Birds of the Island of Ponapé, Eastern Carolines. By Dr. OTTO FINSCH, C.M.Z.S., Director of the Museum of Natural History of Bremen.

[Received September 26, 1877.]

The island of Ponapé, or Ascension (sometimes written on maps Bonaby, Bonabay, Bornaby, Bonabe, Bonibet, Hunnepet, Funopet, Falupet, Falupit, Fanopé, Puynipet) is the largest of the Seniavin group, which extends between 157° 54′ and 158° 30′ E. long., and 6° 43′ and 7° 6′ N. lat., and belongs to the Eastern Caroline archipelago. The island has a surface of about 7½ German miles, a circumference of about 13 German miles, and is inhabited by about 2000 natives. Having been visited only twice by the French expe-

dition of the 'Danaïde,' under command of Capt. Boramel, in 1840, and by the well-known 'Novara' Expedition, in 1858, we were acquainted with only eight species of birds inhabiting it till 1873, when Mr. J. Kubary, the well-known naturalist in charge of the Museum Godeffroy, at Hamburg, explored the island and stayed a year on it. Unfortunately his rich harvest was lost by the wreck of the Godeffroyian brig 'Alfred,' and, except a single skin (out of 200 which Mr. Kubary had collected), only the birds preserved in alcohol were saved. Upon this collection, containing examples of 20 species, I based my first paper on the birds of Ponapé [1]. Since that time a second collection, consisting of well-prepared skins, made by Mr. J. Kubary, has reached me, which gives me a welcome occasion of correcting some statements in my former paper, caused by the bad conservation of some of the specimens in alcohol, and adds seven species more to the avifauna of this island. Among these a species of *Ptilonopus* proves to be new. The total species, therefore, known at present from Ponapé number 29, of which 7 are peculiar to the island.

1. Otus brachyotus (L.), Finsch, Journ. Mus. Godeffr. Heft xii. p. 18.

In the first collection of Mr. Kubary.

2. Trichoglossus rubiginosus (Bp.); Finsch, *l. c.* p. 18.

In Mr. Kubary's first collection.

3. Eudynamis taitiensis (Sparrm.); Finsch, *l. c.* p. 19.

One female.

4. Halcyon cinnamominus, Sws.; Finsch, *l. c.* p. 20.

Of this species and its synonymy I treated in full in my last paper on Mr. Kubary's collection.

5. Collocalia vanicorensis (Quoy & Gaim.); Finsch, *l. c.* p. 23.

In Mr. Kubary's first collection.

6. Myzomela rubratra (Less.); Finsch, *l. c.* p. 26.

Sent already by Mr. Kubary.

7. Zosterops ponapensis, Finsch, *l. c.* p. 27, t. 2. f. 1.

This peculiar species I received in Mr. Kubary's first collection.

8. Calamoherpe syrinx (Kittl.); Finsch, *l. c.* p. 30.

Two specimens; in one the underparts are decidedly yellowish, in the other yellowish white.

[1] *Cf.* "Zur Ornithologie der Südsee-Inseln. II. Ueber neue und weniger gekannte Vögel von den Viti-, Samoa- und Carolinen-Inseln. IV. Vögel von Ponapé (Seniavin Gruppe)," in 'Journal des Museum Godeffroy,' Heft xii. 1876, pp. 14–40, Tafel 1, 2.

9. MYIAGRA PLUTO, Finsch, *l. c.* p. 29.

Male and female, as described by me.

10. RHIPIDURA KUBARYI, Finsch, *l. c.* p. 29, t. 2. f. 2.

One male, as cited above.

11. VOLVOCIVORA INSPERATA, Finsch, *l. c.* p. 27.

Male and female, exactly agreeing with my descriptions, taken from specimens dissected by myself.

There are, besides these, two specimens labelled "Males," which agree in coloration with the female, except that the head and neck above are not greyish, but dark rusty brown, like the upper parts; these, no doubt, are young males.

A third specimen, also marked as a male, is changing from the rufous to the slate-grey dress.

12. CALORNIS PACIFICUS (Gm.); Finsch, *l. c.* p. 31.

One male.

13. APLONIS PELZELNI, Finsch, *l. c.* p. 32, t. 2. fig. 3.

One male, exactly like my description.

14. ERYTHRURA, sp. inc., Finsch, *l. c.* p. 35.

It is to be regretted that this collection does not contain well-prepared specimens of this Finch, as those in the first collection of M. Kubary could not be made out, on account of their preservation in alcohol.

15. PTILONOPUS PONAPENSIS, sp. nov.

"*Pt. fasciatus*, Peale," Finsch, *l. c.* p. 37.

Like *Pt. porphyraceus* (from Tonga), but head, neck, throat, and breast decidedly straw-yellowish (not greenish grey); broad ends of all the tail-feathers (c. 8‴) dark yellow (not whitish).

Size as in *Pt. porphyraceus*: long. tot. c. 8″, al. 5″, caud. 2″ 7‴.

In my first paper I referred the *Ptilonopus* from Ponapé, with a mark of doubt, to *fasciatus*, Peale, having had only specimens preserved in alcohol, which had apparently caused some discoloration; but I expressed my suspicion that they might belong to a distinct species. Having now before me fresh-skinned and adult specimens, I see that my latter supposition was right. The *Ptilonopus* of Ponapé comes nearest to *Pt. fasciatus* and *Pt. porphyraceus*, having the same dark purplish-red cap, surrounded with a faint yellow line (as in *Pt. fasciatus*), but may be distinguished at once from both by the straw-yellow coloration of the remainder of its head and neck and under surface to the vent (which had faded in the previous specimens preserved in spirit), as well as by the colour of the ventral patch. In the latter respect it comes nearest to *Pt. porphyraceus*, the ventral patch being likewise dark green, but with a slight tinge of violet. The broad yellow apical margin of the tail-feathers is also characteristic of *Pt. ponapensis*. The lilac median spots of the outer

secondaries are as in *Pt. fasciatus*, which differs in its purplish vinaceous-red vent-patch.

16. CARPOPHAGA OCEANICA, Less.

One female, exactly agreeing with specimens from the Palaos (Pelew Islands), except that the hind neck and front part of the mantle are of a darker grey. Size the same.

Not yet recorded from this locality.

17. PHLEGŒNAS ERYTHROPTERA (Gm.)?.

Male adult. Front and sinciput to behind the eye, and a narrow line bordering the sides of vertex and occiput, white, as well as the sides of the neck, chin, throat, and breast; sides of head dull brownish, mixed with new white feathers, showing that these parts become also pure white; vertex and occiput slaty black; nape, remainder of upper parts, and wings dark-brown; wing-coverts, scapulars, and some of the mantle-feathers margined broadly with shining coppery violet; underparts and under wing-coverts slaty black, like the remiges; tail-feathers the same, but on the basal half dark grey. Bill and feet horn-brown. A few feathers on the back and shoulders are margined with rufous, as well as the outer secondaries and the coverts of the primaries, showing remnants of the young plumage.

Young (labelled female). Front, sinciput, and sides of head dirty rusty-brown; chin, throat, and breast the same, but mixed and tinged with white; vertex blackish; upper parts not so dark brown, only some of the upper tail-coverts with purplish violet edgings; underparts below the breast dark slate-grey; remiges uniform slaty blackish.

Long. tot.	Al.	Caud.	Rostr. a front.	Tars.	Dig. med.	
in.	in. lin.	in. lin.	lin.	lin.	in.	
c. 9½	5 5	2 8	7	15	10	♂ ad.
..	4 11	..	7	14	10	Jun.

Although it is very strange that, looking at the local distribution of the species of these Pacific Partridge-Doves, the far western island of Ponapé should yield the same species as is said to occur in the Tahiti group, I see no reason to separate the specimens before me specifically from that described by Latham as the "Garnet-winged Pigeon." His description answers pretty well; but having had no opportunity of comparing it with specimens of the true *P. erythroptera* from the eastern islands, which are very rare in collections, I have thought it desirable to add a mark of interrogation to my appellation, as on close comparison perhaps differences might appear which are not to be ascertained by descriptions only.

18. GALLUS FERRUGINEUS, Gm.

Male and female. Of the specimens from this locality, the male shows no difference from specimens from Sumatra, except that the

primaries are not cinnamon, but dull rusty brown, and the wings are a trifle longer (about $\frac{1}{3}$ inch).

The female differs a good deal from a Sumatran specimen; the back, wings, and remainder of upper parts are blackish, nearly without rusty vermiculations; the wing-feathers are externally broadly edged with fulvous, which is the prominent coloration of underparts; the flank-feathers are margined with blackish; the feet are yellow (not dark, as in the Sumatran specimen).

Although no particulars are given, I am inclined to believe that the differences which this bird shows are due to a domestic state.

19. CHARADRIUS FULVUS, Gm.; Finsch, *l. c.* p. 38.

In Mr. Kubary's first collection.

20. STREPSILAS INTERPRES, L.

One male in winter dress, the other nearly in full plumage.
Ponapé is a new locality for this cosmopolitan species.

21. ARDEA SACRA, Gm.; Finsch, *l. c.* p. 38.

One white specimen (labelled female), and one slate-blue (also marked female). The latter shows only a few faint traces of white feathers along the middle of the chin.

22. ACTITIS INCANA (Gm.); Finsch, *l. c.* p. 38.

Sent previously by Mr. Kubary.

23. STERNA BERGII, Licht.

Male and female exactly alike.
Ponapé is a new locality for this Tern.

24. STERNA FULIGINOSA, Gm.; Finsch, *l. c.* p. 39.

In the former collection of Mr. Kubary.

25. ANOUS STOLIDUS (L.), *l. c.* p. 40.

The specimen sent by Mr. Kubary confirms my suggestion as regards the supposed *A. pileatus* in the Vienna Museum, collected during the voyage of the 'Novara,' near Ponapé.

26. ANOUS LEUCOCAPILLUS, Gould.

A. leucocapillus, Saunders, P. Z. S. 1876, p. 670, t. lxi. f. 3.
A. tenuirostris, Finsch (*nec* Temm.), pt., Journ. Mus. God. Heft viii. (1875) p. 42.

One specimen, a young one, with not fully developed wings, but in the full colour of the adult; the sides of the head are uniform black, and not tinged with grey, this being, according to Mr. Saunders, a chief point of distinction in *A. melanogenys*.

I may remark that in a good series of Sooty Terns, from Palau, which are *A. melanogenys*, Gould, = *A. tenuirostris*, Kittl. (not of Temminck, as given erroneously by me), there were two young birds, corresponding in size and colour with the one before me, which also

did not show any grey tinge on the sides of the head. *Cf.* P. Z. S. 1872, p. 114.

27. GYGIS ALBA (Sparrm.); Finsch, *l. c.* p. 40.
Recorded by Von Kittlitz as seen by him near Ponapé.

28. PUFFINUS OBSCURUS (Gm.); Finsch, *l. c.* p. 40.
Already sent by Mr. Kubary.

29. PHAËTON CANDIDUS, Briss.
Two males and one female; the sexes exactly alike; one male is tinged with very delicate rose-colour.
The island of Ponapé is a new locality for this widely distributed species.

4. On a Collection of Birds from Niuafou Island, in the Pacific. By Dr. OTTO FINSCH, C.M.Z.S., Director of the Museum of Natural History of Bremen.

[Received September 26, 1877.]

The island Niuafou (Nina-fou, Niua-fu, Niu-Afohu, Onuafu, Niufo, Nua-fou, or Hope or Proby Island of the older maps), situated in lat. 18° 38′ S. and long. 174° 55′ W., halfway between the Navigators' and Viti groups, may be considered, although somewhat distant, as the most northern island of the Tonga or Friendly group. It was visited in 1866 by Dr. Gräffe; but his investigation as regards ornithology did not much increase our knowledge, as he only informed us of the occurrence of one bird on it, a Megapode already mentioned by Dr. G. Bennett (P. Z. S. 1862, p. 247), and described afterwards by the late G. R. Gray as *M. pritchardi* (P. Z. S. 1864, p. 41). I was therefore pleased to receive, through the Museum Godeffroy of Hamburg, an extensive collection of birds from this interesting island, made by Mr. F. Hübner, a young German collector recently engaged, for the exploration of the Pacific Islands, by Mr. Godeffroy.

This collection raises the number of the known birds of this island from one one to fifteen; but I am able to include from Mr. Hübner's manuscript notes, kindly sent to me by Mr. Schmeltz, five species more, and make the total twenty species. It is worthy of remark that, according to Mr. Hübner's notes, no members of the genera *Ptilotis*, *Lalage*, *Halcyon*, or *Colluricincla*, so well known to him on the Tonga Islands, occur on Niuafou. But it seems probable that further investigations will still add some more species, as the absence of peculiar species (except *Megapodius stairi*, which does not occur in Samoa and is confined to this island) is rather strange.

1. STRIX DELICATULA, Gould.
Native name *Lulu*, Hübner.
One female; agrees in every respect with that from Eua.

2. DOMICELLA FRINGILLACEA (Gm.).

Native name *Hega*, Hübner.

Three specimens (October 1876); not differing from those from Eua. A young bird shows only a few red feathers on the vent; but the red and blue on the head is the same as in old birds.

3. EUDYNAMIS, sp.?

Mr. Hübner (*in litt.*) mentions having heard the call-note of a *Eudynamis*, which, no doubt, will turn out to be *E. taitiensis* (Sparrm.).

4. COLLOCALIA, sp.?

There is no specimen of this genus in the collection; but Mr. Hübner writes:—"The *Beka-beka* (*Collocalia*) breeds in a hole of a rock on the lake in the interior of Niuafu. I always found two eggs or young ones in each nest. The natives laughed when I told them I wanted to obtain eggs of these birds, as they believed them not to lay eggs at all."

5. APLONIS TABUENSIS (Gm.).

Native name *Megi*, Hübner.

Three specimens (October 1876). The underparts look a little more brownish; but this may be caused by the specimens not being in full plumage and partially moulting; otherwise there is no difference from Eua birds in colour or dimensions, except that the bill is a little shorter; but this may also be a sign of immaturity.

6. PTILONOPUS PORPHYRACEUS (Forst.).

Native name *Kulu-kulu*, Hübner.

Two specimens, adult, male and female (October 1876); are exactly like specimens from Eua.

This species is easily distinguishable from *Pt. fasciatus*, Peale (who first obtained that species on the Navigators'), by the dark purplish-violet spot on the middle of the vent, which in *Pt. fasciatus* is dark purplish-vinaceous. All the specimens which I have inspected from Upolu and Uea (Wallis Island) agree in this respect; but I have no specimens from the Vitis for comparison. According to Mr. Layard (P. Z. S. 1876, p. 495) the Viti bird is of a different species, which he erroneously calls *Pt. apicalis*, Bp. As Bonaparte established his species on a specimen from Vavao (Tonga Island), it belongs undoubtedly to *Pt. porphyraceus*, whereas the name *fasciatus*, Peale, should stand for the Navigators' bird, having been founded on specimens from this locality. If the Vitian *Ptilonopus* is really different from *Pt. fasciatus* and *Pt. porphyraceus*, it must be renamed.

7. CARPOPHAGA PACIFICA (Gm.).

Not in the collection, but observed by Mr. F. Hübner.

8. MEGAPODIUS STAIRI, Gray, P. Z. S. 1861, p. 290 (Samoa!).

M. pritchardi, P. Z. S. 1864, p. 41, pl. vi. (Nina-fou).

M. pritchardi and *M. stairi*, F. & H. Ornith. Central-Polyn. pp. 153, 155.

M. huttoni, Bull. Trans. and Proceed. N.Z. Inst. iii. 1871, p. 14.

M. pritchardi, Hutt. ib. iv. 1872, p. 165.

M. (? *burnabyi*, Gray), Finsch, Journ. f. Orn. 1870, p. 420.

M. stairi, Finsch, ib. 1872, p. 52; Layard, P. Z. S. 1876, p. 496 (part.).

M. burnabyi, Layard, P. Z. S. 1876, p. 583 (part.).

Native name *Malau*, Hübner.

Male and female, old, and young bird (November 1876). The two former agree exactly in coloration and size; the last is considerably smaller, but in colour like the old.

Al.		Rostr. a rict.	Tars.		Dig. med.	Ung.	
in.	lin.	lin.	in.	lin.	lin.	lin.	
6	9	11	2	2	14½	7	♂
6	7	11	2	1	15	8	♀
5	5	9½	1	9	12½	6½	Jun.

Since Mr. Layard assures us that *M. stairi*, Gray, was based on specimens from Ninafu (and not from Samoa, where no Megapode exists) the older name must be applied to this species.

Mr. F. Hübner gives us the following observations on this bird:—"The breeding-time of this species is not so confined to certain months as has been noticed by Mr. Wallace in respect of certain Malayan species. He gives as the season of incubation August and September; but of this bird I got fresh eggs in October and November also, and, according to Captain Nagel and the natives, eggs are to be found likewise in other months. The newly hatched ones are yellowish-brown with brown undulations; their necks are feathered and not marked as in the old birds. Immediately after leaving the eggs the young birds are not only able to run, but also to fly. The old birds are excellent runners; their flight is somewhat heavy, as in the common fowl; when alarmed they perch on trees. The stomachs of those specimens which I shot I mostly found filled with land-shells, small crabs, and Scolopendras; but in a few cases I found seeds. My captured specimens I fed with Blattæ and Scolopendras, and the young ones (of which I kept one three weeks) with Termites and mashed cocoa-nuts. They refused to eat yams. The male may be distinguished at once from the female by its orange feet, which in the latter are yellow."

9. Charadrius fulvus, Gm.

Native name *Kiu*, Hübner.

Three specimens shot in October (1876) in change of plumage, showing that this arctic species loses its summer garb in its winter resorts. One specimen has already the full winter dress; the others are moulting and still show many black feathers on the under surface.

10. Strepsilas interpres (Linn).

Native name *Kiu-hina-hina*, Hübner.

One male in the winter dress (October 1876).

11. ACTITIS INCANA (Gm.).

Native name *Kiu-lega-lega*, Hübner.

Three specimens, shot in October (1876); two in full winter garb, one moulting from summer to winter dress, showing most of the latter.

12. ARDEA SACRA, Gm.

Native name *Motuku*, Hübner.

One female, of a dusky slate-colour (October 1876).

13. ORTYGOMETRA, sp. inc.

A species of *Ortygometra* is mentioned by Mr. Hübner; most probably it will turn out to be *O. cinerea*, Vieill. (*quadristrigata*, Horsf.), the most widely distributed and commonest species in the Pacific.

14. RALLUS PHILIPPENSIS, Briss.

Native name *Veka*, Hübner.

Three specimens (October 1876). One old male shows only traces of the maroon-coloured pectoral band, in every respect agreeing with specimens from the Navigators', Palaus, Tongas, New Zealand, and New Holland. Two young birds, one still half in dun feathers, are coloured in the same pattern as the old, but duller and colours less decided.

15. PORPHYRIO, sp. inc.

Mr. F. Hübner mentions the occurrence, according to the reports of the natives, of a *Porphyrio* which is probably *P. samoënsis*, Peale.

16. ANAS SUPERCILIOSA, L.

Native name *Toloa*, Hübner.

One specimen (October 1876).

Al.	Caud.	Rostr.	Tars.
in. lin.	in. lin.	lin.	lin.
8 3	2 9	20	18

Agrees with specimens from Eua and Navigators' which are, apparently, constantly smaller than the true *A. superciliosa* from New Zealand, as has been remarked already by Peale. In their smaller size they agree with *A. pelewensis*, H. & F. (Journ. Mus. Godeffr. 1875, p. 40); but the latter has the eye-stripe and sides of head isabelline-rusty, and the black cheek-stripe is nearly wanting.

17. ANOUS STOLIDUS, L.

Native name *Gogo*, Hübner.

A young bird (October 1876), just developing the wings and tail-feathers, uniform dusky, with white front. Bill not yet full-grown therefore very short (only 14‴), as are the wings (only 7″ 5‴).

"This species breeds on trees or the precipitous rocks on the sea-side, and always lays but one egg."—*Hübner*.

18. Gygis alba (Sparrm.).

Native name *Tala*, Hübner.

One old male (October 1876).

The island Niuafu is a new locality for this widely distributed species.

"This species also lays but one egg, in a shallow hole on a horizontal branch of a tree, without any other material."—*Hübner*.

19. Puffinus obscurus (Gm.).

P. dichrous, F. & H. Ornith. Central-Polyn. p. 244; Finsch, Journ. Mus. Godeffr. Heft viii. 1875, p. 44; id. ib. *Puffinus*, sp.? (Viti).

P. dichrous, obscurus, audubonì, and sp.? (from Viti), Finsch, P. Z. S. 1872, p. 108–112.

Native name *Teiko*, Hübner.

Male and female (October 1876), in every respect like specimens from Palau; the under tail-coverts are black, more extended in the male, with faint white tips.

Alæ.	Caudæ.	Culm.	Rostr. a rict.	Alt. basis.	Long. tars.	Dig. med.	
in. lin.	in. lin.	lin.	lin.	lin.	lin.	lin.	
7 2	2 11	12	15	3¼	16	15½	♂
7 5	3 2	12	16	...	16	16	♀

For several years I have paid special attention to the Procellariidæ, among the numerous members of which a good many still remain obscure generically and specifically; and none have troubled me more than the *Procellaria obscura* of Gmelin, described originally nearly a hundred years ago by Latham from Christmas Island.

In my former notes on this subject I have endeavoured to show that under this name were confounded about four species, nearly allied but differing in the coloration of the under tail-coverts and in the extent of the black and white on the cheeks. I thought it certain that there were at least two distinct species—one with black under tail-coverts (*Puffinus dichrous*, F. & H.), from the Pacific, the other with white under tail-coverts (the true *P. obscurus*, Gm.), from Madagascar. (Cf. Finsch, P. Z. S. 1872, pp. 108, 110, and Journ. f. Ornith. 1874, p. 208.) Since my last publication on this subject I have had the pleasure not only of examining one of Latham's types in the Vienna Museum (*P. tenebrosus*, Natt.), but also a series of specimens from the Palau group, together with others from Mauritius, Bourbon, and Madagascar, kindly lent to me by Dr. von Pelzeln and Professor Newton. The careful examination of this material, richer perhaps than any one has before had in aid of his studies, convinces me that the coloration of the under tail-coverts forms no distinctive character, as there exist all phases of graduation, from specimens with the under tail-coverts pure white to such as have these parts partially or nearly uniform black. The following notes taken of series of skins will prove this to be the case.

a. Latham's type from the Leverian Museum (now in the Vienna Museum), said to be from King George's Sound. Type of *P.*

tenebrosus, Natt. Under-tail coverts black with narrow white tips; the middle row with their shafts white. Exactly like specimens from the Palau group and M'Kean's Island (type of *P. dichrous*, F. & H.); the latter has the white on the base of the lateral under tail-coverts more extended.

b. Specimens from Madagascar (Vienna Museum). Under tail-coverts of a uniform white.

c. Specimens from Bourbon in the Leyden Museum (labelled in Temminck's handwriting *Puffinus obscurus* ♀, Temm. Man. d'Orn.). Like the foregoing, but the lateral under tail-coverts fringed with dusky on the outer web.

d. Specimens from Mauritius (Coll. Newton). Lateral under tail-coverts on the whole outer web dusky.

e. Specimens from Cape Florida (Deppe, Berlin Museum, *P. obscurus*, Audub., and type of *P. auduboni*, Finsch). "Longest lateral under tail-coverts uniform dusky, the anterior lateral under tail-feathers on the outer vane black, on the inner white."

f. Specimen (s. n. *obscurus*?) from Mauritius (Coll. Newton). "Under tail-feathers dark brown, with white tips, exactly like Palau specimens."

g. Specimens from Viti (*Puffinus*, sp.? Finsch, P. Z. S. 1872, p. 112, and Mus. Godeffr. 1875, viii. p. 45, note). "Under tail-coverts uniform smoky-black, with hidden white at their bases.

These notes will convince every one that the black or white of the under tail-feathers forms no specific character, and even less so the more or less extent of the black along the rictal line, which sometimes (according to the preparation of the skin) is cut off at the under margin of the eye, sometimes runs a little further down.

P. obscurus has, between the tropics, a wide distribution in the Atlantic and Pacific regions, but has not yet been observed along the coast of Europe, as has been maintained by Temminck, Schlegel, and others.

Its nearest ally, *P. anglorum*, may be distinguished by its larger size and lighter coloration.

On this species Mr. Hübner remarks:—"The *Teiko* lives on a small island, where during daytime it sleeps in holes in the rocks. I obtained my specimens when rowing just before daybreak in a canoe round the islands. We watched when the birds left their holes and, becoming confused by the glare of a torch, allowed us to catch them by hand."

20. PHAËTON CANDIDUS, Briss.

Native name *Tavaki*, Hübner.

One old female (November 1876).

5. On the *Tænia* of the Rhinoceros of the Sunderbunds (*Plagiotænia gigantea*, Peters). By A. H. Garrod, M.A., F.R.S., Prosector to the Society.

[Received October 1, 1877.]

In 1856 [1] Dr. Wm. Peters described a tapeworm which he found in an African Rhinoceros from Mossambique, which he named *Tænia gigantea*.

In 1870 [2] Dr. Murie described the adult proglottides of a tapeworm passed by an Indian Rhinoceros (*Rhinoceros unicornis*) living in the Society's Gardens at the time, which he named *Tænia magna*?.

In 1871 [3] Dr. Peters communicated to the Society a Note on the results of a comparison of his specimens of *Tænia gigantea* with Dr. Murie's description and figures of his *Tænia magna*?, showing their identity, and suggesting the generic name *Plagiotænia* for the species.

During this summer I have had the opportunity of eviscerating a half-grown female of *Rhinoceros sondaicus*, from the Sunderbunds, which had been a little more than six months in this country. In the commencement of the colon I found three tapeworms with their heads (scoleces), together with several detached groups of proglottides [4], these latter being quite undistinguishable from those figured by Dr. Murie, in form as well as size.

Dr. Peters has figured the scolex in his species, which is evidently in a powerfully contracted condition, to which one of my three specimens closely approaches. My other two specimens are not so, and, as a result, differ so much in appearance that I subjoin a figure of one of them.



Scolex of *Plagiotænia gigantea*, much enlarged; superior and lateral view.

Of the specimen here figured the breadth (after being kept in alcohol) of the scolex, opposite the suckers, is 4 millimetres, whilst the depth, to the lower of the two more strongly marked transverse

[1] Monatsb. der Akad. der Wissensch. zu Berlin, 1856, p. 469.
[2] P. Z. S. 1870, p. 608.
[3] P. Z. S. 1871, p. 146.
[4] In his account of his specimens Dr. Murie has most curiously mistaken the groups of proglottides (which he figures) for single segments.

lines below the suckers (the proliferating area), is 3 millimetres. The breadth of the largest of the proglottides is 3·1 centimetres, their depth being 4·5 millimetres. One decimetre from the end of the scolex the proglottides are 1·42 centimetre in breadth.

In one respect the scolex differs from that described by Dr. Peters, the rostellum or little conical elevation between the suckers being scarcely even indicated as such. This, however, seems hardly sufficient to justify specific separation.

It is an interesting fact that three different species of *Rhinoceros*, so separated in their distribution, should be troubled with the same tapeworm, which must therefore, unvarying, have followed the ancestral species in its different variations, now so easily distinguishable.

6. Notes on the Anatomy of the Chinese Water-Deer (*Hydropotes inermis*). By A. H. Garrod, M.A., F.R.S., Prosector to the Society.

[Received October 1, 1877.]

Since the discovery by Mr. Swinhoe of the Chinese Water-Deer, which in the 'Proceedings' of this Society[1] he named *Hydropotes inermis*, naturalists have been anxious to obtain information upon its visceral anatomy, together with other features not ascertainable from adult skins or from the skeleton. At Tours our Corresponding Member M. J. Cornély has succeeded in breeding the species[2], the Society having allowed him the loan of its male specimen, and his example being of the opposite sex. One of the three young ones, a female, having died shortly after its birth, M. Cornély forwarded it to Mr. Sclater, who has kindly placed it in my hands for description; and it is my notes upon this specimen which I take an opportunity of laying before the Society.

From the tip of the nose to the base of the tail the specimen is 16 inches, the tail being an inch long. From the top of the shoulder to the tip of the hoof of the fore limb it measures 12 inches. The colour of the hair, after being in spirit for some days and then dried, is a dark greyish brown, which is redder along the back than at the sides. The abdomen, as well as the throat, is a dirty white, as are the hairy inner surfaces of the ears.

The fawn is spotted with white[3]. The spots are not numerous or pronounced. They run in longitudinal lines from the neck to the tail, with a median area about 1·5 inch broad unspotted. There is one line, the upper, fairly defined and uninterrupted; two others, lower down, are irregular and shorter. The spots are not distinct,

[1] P. Z. S. 1870, p. 89.

[2] See M. Cornély's article in Bull. Soc. d'Acclim. 3e sér. t. iv. p. 417; and note, P. Z. S. 1877, p. 533.

[3] In the Society's 'Proceedings,' 1872, p. 817, Mr. Swinhoe remarks, "I learn from Mr. Russell that the fawn is spotted with dark-brown spots all over the hind quarters." I could not detect any trace of these.

because they are not produced by the presence of hairs which are white throughout, but by dark reddish hairs tipped with white for not more than one sixth of their length.

The nipples are four in number. The crumenal glands are quite small. No supraorbital glands were recognizable. In the fore limb the interdigital skin is inflected but slightly, and there is no special gland differentiated, although the surface of the skin is apparently studded with minute gland-openings. In the hind limb the interdigital skin forms a deep pocket, which almost completely separates the toes, except that they are joined by a thin transverse skin-fold along their posterior edges. The included skin is studded with small glands. I can find no trace of any metatarsal glands.

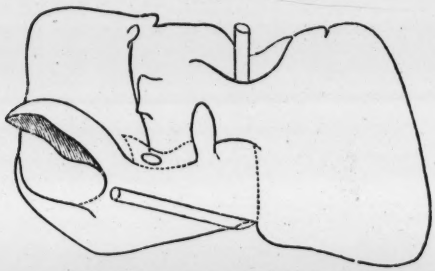
The muffle is as deep as broad, and extends one half up the outer margin of the narial orifice.

In the new-born female the milk-incisors and lower canines are cut, as is the sharp small upper canine. The milk-molars are in place, partly disguised by a layer of mucous membrane covering them. The anterior portion of the palate is covered with the ordinary transverse ridges, running outwards from the middle line; posteriorly it is smooth.

The tongue shows but little of the intermolar eminence. The fungiform papillæ are numerous, and stand out conspicuously. Postero-laterally they develop into lines of papillæ circumvallatæ.

The stomach is not favourable for study, because of its being so little developed. The villi on the rudimentary paunch look like the pile on thick-set velvet. The hexagonal cells in the reticulum are conspicuous though not high-walled. By the aid of a magnifying

Fig. 1.



Liver of *Hydropotes inermis* (still-born).

glass the psalterium is seen to be quadruplicate—in other words, to have its laminæ arranged in four powers, there being two primary laminæ, with secondary smaller folds between them, on each side of which are smaller laminæ, with linear rows of papillæ (rudimentary laminæ) between them, of the fourth power. The large abomasum is not peculiar.

The spleen is circular, flat on its gastric, and convex on its parietal surface.

The liver (fig. 1, p. 790) has no gall-bladder, therein being quite cervine. There are one or two minor lobules so situated as to develop a spurious cystic fossa; and what is still further interesting is, that in that fossa there is a white fibrous cord which runs from the transverse fissure nearly to the ventral margin of the abdominal surface of the right lobe, exactly in the situation of a gall-bladder. Once previously in a Deer (*Cervus virginianus*, I believe) have I seen a similarly situated fibrous cord, which I can hardly believe to be any thing else than an atrophied gall-bladder, although I was not able to trace its connexion with the bile-duct on account of the bad state of preservation of the specimen.

The Spigelian lobe is proportionally well developed, being tongue-shaped (or rusiform) as in the genus *Rusa*. The caudate lobe is of fair size. The umbilical fissure is shallow, the left hepatic lobe being slightly smaller than the right, both being of a square shape.

The intestines measure 9 feet 8 inches, the small intestines 7½ feet long, the large 2 feet 2 inches. The cæcum is 1½ inch long. No trace is visible of an ileo-cæcal gland. There are 2½ colic coils, there being an irregular reversed half-loop in the returning portion of the spiral.

In the bicorn uterus of this new-born animal the cotyledonary papillæ are as manifest as in that of the pregnant adult. There are four in one cornu and three in the other, the highest of these in the latter being particularly large. I have, in my paper on the visceral anatomy of the Ruminantia (P. Z. S. 1877, p. 12), mentioned that in a pregnant uterus of *Hydropotes*, which was lent me kindly by Mr. Ewart, of University College, there were three cotyledons in one cornu and five in the other, which agrees very closely with the specimen under consideration.

The brain is very much like that of the Pudu Deer (*Cervus pudu*) figured by Prof. Flower[1], mainly differing in that the hippocampal gyrus is much less conspicuous upon the superior aspect. It is considerably more convoluted than that of *Moschus moschiferus*, upon the typical Ruminant pattern. I take the opportunity of figuring it (*vide* fig. 2, p. 792) from above.

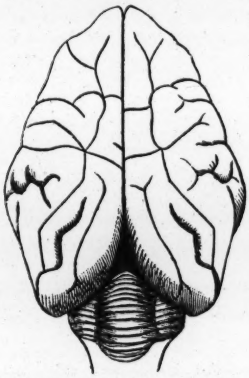
Reviewing the above-described anatomical features, the differences between the visceral anatomy of *Hydropotes inermis* and *Moschus moschiferus* clearly indicate the slightness of their relationship. In the former we find a fairly convoluted brain, a quadruplicate psalterium with 10 primary laminæ, no ileo-cæcal gland, no gall-bladder, two and a half colic coils, and an oligocotyledonophorous uterus; whilst in the latter the brain is comparatively smooth, the psalterium is dupliciplicate, with 20 or so primary laminæ, a large ileo-cæcal gland, a gall-bladder, three and a half colic coils, and a specialized linear cotyledonary arrangement. In other words, *Hydropotes* is typically Cervine, whilst *Moschus* is any thing but so.

To what group of the Cervidæ *Hydropotes* is most allied there is

[1] P. Z. S. 1875, p. 177.

still considerable uncertainty. That it is not allied to the New-World type is evident from its vomer not extending downwards to join the osseous palate posteriorly. That it is not Cervuline is

Fig. 2.



Brain of *Hydropotes inermis* (still-born).

equally certain on account of its tarsal cuneiform bones being free from the naviculo-cuboids. Its large hepatic Spigelian lobe favours the view suggested by Sir Victor Brooke[1], that it is most closely allied to the Rusine Deer.

7. Note on the possible Cause of Death in a young Seal. By A. H. Garrod, M.A., F.R.S., Prosector to the Society.

[Received October 17, 1877.]

On October 1, 1877, Mr. G. Mellin presented to the Society a female Common Seal (*Phoca vitulina*), which died on the 9th of the same month. He obtained it from the Scilly Islands on September 27th, when it had attached to it the rudiments of the umbilical cord, which dropped off on the 30th, three days later. It must therefore have been born only a few days. When in the Society's Gardens it sucked milk freely from a baby-feeding bottle, and exhibited no pathological symptoms. As it did not take kindly to the water, it remained almost entirely on land.

On post-mortem examination it was found to be three feet two inches in length from the tip of its nose to the end of its tail, along the back. The lungs were of a dark red colour, collapsed, containing scarcely any air, and scarcely floating in water, otherwise also resembling those of a suffocated new-born child. The kidneys were

[1] P. Z. S. 1872, p. 525.

dark on section being made in the cortical portions, and quite white at the apices of the cones.

It is the heart which was peculiar, in that neither the ductus arteriosus nor the foramen ovale were obliterated, and they appeared to be as patent as they could ever have been in fœtal life. The question then suggests itself as to whether the animal suffered from cyanosis, of which it died, or whether in the Pinnipedia the semi-fœtal circulation continues for longer after birth than in other mammals.

The creature having lived for nine days in the Society's Gardens, and having lost the umbilical rudiment a day before it arrived, was probably about a fortnight old when it died, and ought, according to analogy with the human infant, to have lost all traces of the fœtal cardiac peculiarities; whereas the ductus arteriosus and the foramen ovale were not even beginning to be obliterated. This can hardly have been otherwise than pathological, which leads me to the inference that it died morbidly cyanotic, perhaps because it lacked its normal maternal milk, and so was not in a condition to repair its fœtal imperfections.

8. Note on the Absence or Presence of a Gall-bladder in the family of the Parrots. By A. H. Garrod, M.A., F.R.S., Prosector to the Society.

[Received October 17, 1877.]

In a former communication [1] I had the opportunity of showing that the generalization, founded upon the dissection of an insufficient number of genera, that the gall-bladder is wanting in the Columbæ, does not apply to *Carpophaga*, *Lopholæmus*, or *Ptilonopus*. On the present occasion I have to correct a similar error with reference to the Psittaci, because I have found a well-developed gall-bladder in specimens of *Cacatua philippinarum*, *Cacatua goffini*, *Cacatua moluccensis*, and *Calopsitta novæ-hollandiæ*, in which last-named species it is small and easily overlooked.

In my earlier dissections I have not recorded the presence of a gall-bladder in any species of Parrot. That, no doubt, is because, it being absent in so many, I did not expect to find it.

From the above facts it is highly probable that the presence of a gall-bladder in the Cacatuinæ will have to be included among the characteristic peculiarities of this subfamily. At the same time its persistence in them is in favour of the view that the Palæornithinæ, as restricted by me [2], are but little different from the ancestral Parrots, and the Cacatuinæ still less so. The primitive Parrots must have possessed a gall-bladdder—because we now know that this organ is present in the Cacatuinæ, and consequently was not absent in the primitive species, as the probability that it should have been independently developed a second time is infinitely little.

[1] P. Z. S. 1874, p. 257. [2] P. Z. S. 1874, p. 594.

9. Reports on the Collections of Birds made during the Voyage of H.M.S. 'Challenger.'—No. V. On the *Laridæ* collected during the Expedition. By Howard Saunders, F.L.S., F.Z.S.

[Received October 25, 1877.]

At the request of Mr. Sclater, I have undertaken with much pleasure the determination of the *Laridæ* collected during the expedition of H.M.S. 'Challenger,' amounting in all to 47 specimens. It was hardly to be expected that amongst these any previously undescribed species would be found; but in consequence of the careful manner in which the specimens have been catalogued and labelled by Mr. John Murray, many of them are of great value in increasing our knowledge of the geographical distribution of the Oceanic birds. It is highly desirable that more attention should be devoted to this subject, instead of being limited, as is so often the case, to land birds only; and of the results which would probably reward such attention we may judge from the present small collection, which contains examples of 9 species, represented by 31 specimens, of Terns (*Sterninæ*), of 5 species, represented by 11 specimens, of Gulls (*Larinæ*), and of 3 species, represented by 5 specimens, of Skua gulls (*Stercorariinæ*); total 17 species, 47 specimens. Of these species, five have been obtained in absolutely new localities (three of them from places where they could hardly be expected to occur), whilst many of the other species derive unusual interest from the fact of their range being restricted to such seldom-visited spots as the rocks and islands of the South Atlantic. On the whole this collection of Laridæ, although small in numbers, is one of the most productive of knowledge which has yet been made by any of our national expeditions.

1. Hydrochelidon hybrida (Pallas).

Sterna hybrida, Pall. Zoog. Rosso-As. ii. p. 338 (1811).
Hydrochelidon hybrida, Gray, Gen. B. iii. p. 660; Saunders, P. Z. S. 1876, p. 640.

[No. 364. ♀. Manila. January 11th–14th, 1875. Eyes black, feet dark red; stomach had crustacea.]

A nearly adult specimen, the head being slightly streaked with black.

2. Sterna virgata, Cab.

Sterna virgata, Cabanis, J. f. Orn. 1875, p. 449; Saunders, P. Z. S. 1876, p. 646.

[1 specimen marked X on label. Christmas Harbour, Kerguelen Island.
1 specimen marked Θ on label. Ditto, ditto.
1 „ Ditto, ditto.
1 „ Betsey Cove. ditto.]

The first is nearly adult; but the black head is not yet fully

assumed, and the bill and feet are still reddish black; in the second the black head only is wanting to complete the nuptial dress; but the third is in full breeding-plumage, as is also a specimen in spirits.

The specimen from Betsey Cove is a young bird just fledged, many particles of down still adhering; general colour sooty grey mottled with brown, and barred with black on the upper parts; under wing-coverts white.

This somewhat specialized form has hitherto been only found at Kerguelen Island, and appears to be more closely allied to the New-Zealand species *S. antarctica*, Wagler, than to the less restricted form *S. vittata*, which also includes in its range portions of the same island. The principal specific distinctions of the two species are given in my paper on the Sterninæ above referred to.

3. Sterna vittata, Gm.

Sterna vittata, Gm. Syst. Nat. i. p. 609 (1788); Saunders, P. Z. S. 1876, p. 647.

[1 specimen. Inaccessible Island, Tristan d'Acunha, October 18th, 1873.

1 specimen. Royal Sound, Kerguelen Island, January 1874.]

Both these specimens are adults in breeding-plumage; but the latter is not a very old bird, the outer webs of the long tail-feathers being still slightly tinted with grey, whereas in really mature examples they are long and white. In pointing out its specific characters (*l. s. c.*), I gave its then known range as from Kerguelen Island up to St. Paul's and Amsterdam Islands, about 700 miles to the north, apparently its head quarters, and as that of a straggler over the sea between St. Helena and Ascension; but the fact of its having been obtained close to Tristan d'Acunha is an interesting extension of these limits. When treating of the few examples then available from the above-mentioned localities, I remarked that the affinities of this species were decidedly with *S. hirundinacea*, Less. (*S. cassini*, Scl.), of the extra-tropical coasts of South America and of the Falkland Islands; and this view has subsequently been confirmed by the examination of a larger series brought home by the French naturalists from the Transit-of-Venus Expedition, at the same time that the two species are always perfectly distinguishable. But in the case of this individual from Tristan d'Acunha (its nearest known approach to South America), it is interesting to observe that, although the example is *undoubtedly* referable to *S. vittata* and *not* to *S. hirundinacea*, it comes nearer to the latter species than any other specimen yet examined. However, its relatively smaller size, grey colour, and the characteristic shortness of the foot and claws show distinctly that the bird in question is *S. vittata*; and although it has a rather unusually long bill, yet there is an absence of the long curve characteristic of the American bird. It may be remarked that the bill in individuals of the present species seems to be peculiarly brittle and friable, which will account for the worn and blunted appearance often to be observed in the anterior portions of the mandibles.

There are the remains of an egg, labelled as taken at Heard Island,

February 1874, which evidently belongs to either *S. virgata* or *S. vittata*; I incline to attribute it to the former, owing to its size and dull appearance.

4. STERNA HIRUNDINACEA, Less.

Sterna hirundinacea, Lesson, Tr. d'Orn. p. 621 (1831); Saunders, P. Z. S. 1876, p. 647.

[No. 652, ♂. Messier Channel, Straits of Magellan, January 4th, 1876. Eyes black, bill and legs vermilion.

No. 723, ♂. No. 724, ♀. Elizabeth Island, Straits of Magellan, January 18th and 19th, 1876. Eyes black; bill and legs red; stomach had fish. A number of eggs were preserved, there being a large "rookery" at one of the low points of this island.]

Three fine and fully adult specimens of this well-known South-American species. Sixteen eggs from this locality are naturally rather larger than the type of those of *S. fluviatilis* or *S. macrura*; but otherwise they merely exhibit the same variations in markings.

5. STERNA BERGII, Licht.

Sterna bergii, Licht. Verz. Doubl. p. 80 (1823); Saunders, P.Z.S. 1876, p. 657.

[No. 77, ♂. Levuka, Fiji, July 30th, 1874. Eyes black; feet black, soles brown.] Nearly adult.

[No. 231, ♀. Dobbo, Arru Islands, September 16th and 17th, 1874. Eyes black; feet black; bill light yellow.]

A bird of the year.

[No. 345, ♂. Zamboanga, Philippine Islands, October 24th, 1874. Eyes black.]

Nearly adult, but in winter plumage, the head being merely striated and not black.

[No. 486, ♂. Nares Harbour, Admiralty Islands, March 3rd–10th, 1875. Eyes black.]

Adult, with the black head and crest, and the white frontlet band characteristic of the breeding-plumage.

6. STERNA FULIGINOSA, Gm.

Sterna fuliginosa, Gm. Syst. Nat. i. p. 605 (1788); Saunders, P. Z. S. 1876, p. 666.

[1 specimen ♀. Boatswain-bird Island, Ascension Island, about April 4th, 1873.

No. 124, ♀. No. 125, ♂. Raine I., Barrier Reef, Australia. Eyes, bill and feet black. Stomach of first contained a cuttlefish and a piece of coral; that of second, nothing. In great numbers. Eggs rounded and more spotted than those of the Noddy.]

Fifteen eggs of this species from Raine Island form a very fine series.

These three specimens are in adult breeding-plumage, the long outer tail-streamers being, however, somewhat abraded.

7. GYGIS CANDIDA (Gm.).

Sterna candida, Gm. Syst. Nat. i. 2, p. 607 (1788).

Gygis candida, Wagler, Isis, 1832, p. 1223; Saunders, P. Z. S. 1876, p. 667.

[2 specimens, ♂ and ♀. Boatswain-bird Island, Ascension Island, about April 3rd, 1873.

No. 546, ♀. } Tahiti. September 18th–October 2nd, 1875. Shot
No. 547, ♀. } by Balfour on trees near Papuerini? Eyes black.]

There are also two specimens in spirits.

All these examples have bills broad at the base, although from the mandibular angle to the tip there is some slight variation, those of the Tahitian birds being more pointed, whilst in those from the volcanic crags of Boatswain-bird Island the bill is evidently worn down and blunted. In the coloration of the webs of the feet, also, the Tahitian birds are of a brighter lemon-colour; but the extent of this colour is the same in all, viz. down to and a little below the last joint of the middle toe. The shafts of the tail-feathers and of the primaries seem liable to become white with the age of the feather itself, owing to abrasion of the surface; but in no case are the characteristics wanting which distinguish this species from *G. microrhyncha*, only known at present from the Marquesas Islands, where the present species is also found. The fact of its being obtained near Ascension Island is an interesting addition to our knowledge of its range, as it has not yet been recorded on that side, so far as I am aware, beyond St. Helena.

8. ANOUS STOLIDUS (Linn.)

Sterna stolida, Linn. Syst. Nat. i. p. 227 (1766).

Anous stolidus, Gray, List Gen. Birds, p. 100 (1841); Saunders, P. Z. S. 1876, p. 669.

[2 specimens. Inaccessible Island, near Tristan d'Acunha, October 16th, 1873. Eyes black. Live in caves and on trees.

No. 140, ♂. Raine Island, Australia. Feet, bill, and eyes black.

No. 444, ♀. At sea: lat. 1° N., long. 137° 11′ E.

No. 485, ♀. Admiralty Islands, March 3rd–10th, 1875.

No. 564, ♂. At sea, near Tahiti, October 1875.]

In alcohol. Egg, and newly hatched young, St. Paul's Rocks, Atlantic, August 28th, 1873.

9 eggs from Raine Island, August 31st, 1874.

This is a very interesting series, showing the changes resulting from age, both in the individual and in the annual plumage. The examination of a great number of Noddies from various localities tends to show that specimens in clean and fresh plumage are very rarely to be met with; and the weatherworn appearance of some individuals, when compared with freshly moulted birds, would lead the superficial observer to suppose that he had before him distinct

species. The example No. 564 is an instance of this, it being a superb *old* bird, freshly moulted, with all the edges of the feathers perfect, the crown of the head of a pale lavender, and with much smoke-colour on the throat, neck, and breast; the primaries and tail-feathers like satin, and having in some cases not quite attained their full length; altogether the finest specimen of the common Noddy I ever saw. Both this and the next species are described in Mr. Murray's journal as being very abundant at the Admiralty Islands, hovering in immense numbers over shoals of fish. That the general range of these species is intertropical is tolerably well known; but it is somewhat surprising to find both this and *A. melanogenys* at Inaccessible Island, close to Tristan d'Acunha, in 37° S. latitude, on the peculiar domain of the Albatross and the Penguin. The two examples of *A. stolidus* from there are absolutely identical with specimens from the Tortugas; and I can find no reason for attributing any of the larger form to other than this species.

9. ANOUS MELANOGENYS, Gray.

Anous melanogenys, G. R. Gray, Gen. Birds, iii. p. 661, pl. 182 (1849); Saunders, P. Z. S. 1876, p. 670.

Anous tenuirostris mult. auctorum, nec Temm.

[In alcohol. Adult, young in down, and egg. St. Paul's Rocks, Atlantic Ocean.

1 specimen. St. Paul's Rocks, August 27th, 1873.

1 specimen. Inaccessible Island, Tristan d'Acunha, Oct. 16th, 1873. In caves and on trees.

No. 484, ♀. Admiralty Islands, March 3rd and 10th, 1875.

No. 508, ♀. At sea. March 20th, 1875. Stomach contained small crustacea. Eyes black.]

In the adult specimen from St. Paul's rocks, where the breeding-season was far advanced, the feathers are much worn; and the bird from Inaccessible Island appears to be only a few months old, the portion of the bill in front of the mandibular angle being very short and weak. Under the head of the preceding species I have already remarked upon the noteworthy fact of these two Noddies being found so far south; and it would be interesting to know if they breed there. The specimens from the Admiralty Islands are adults.

10. LARUS RIDIBUNDUS, L.

Larus ridibundus, Linn. Syst. Nat. i. p. 225 (1766).

[No. 363, ♂. Manila, January 11th and 14th, 1875. Eyes brown.

4 specimens, 2 ♂, 2 ♀. Yokohama, Japan, May 1875. Eyes brown.]

The Manila specimen and two of the Japanese are birds of the previous year; the other two are adults. One of these, a female, is remarkable for its small size, the wing (allowing for a deficient primary) being only 11·5 inches long; still I have seen and possess similar examples of diminutive females from other localities, as well as from Japan and China; and the other parts being in proportion, there is nothing else to distinguish this from the ordinary form.

11. LARUS CANUS, Linn.

Larus canus, Linn. Syst. Nat. i. p. 224 (1766?).

♂. Japan, May 1875.

A bird of the previous year; wing-coverts much abraded.

12. LARUS GLAUCODES, Meyen.

Larus glaucodes, Meyen, Obs. Zool. p. 115, pl. 24 (1834); Scl. & Salv. P. Z. S. 1871, p. 578.

[No. 650, ♂. Messier Channel, Straits of Magellan, January 4th, 1876. Eyes hazel, feet and bill reddish.]

A bird of a full year old, the tail being nearly devoid of the band showing immaturity; but the shoulders retain some brownish feathers.

Two eggs presented by Mr. Deans, of Stanley, Falkland Islands, marked "Tern Gull" appear to belong to this species, which is a well-known breeder in that group.

13. LARUS NOVÆ-HOLLANDIÆ, Steph.

Larus novæ-hollandiæ, Steph. in Shaw's Gen. Zool. xiii. pt. i. p. 169, ex Lath. (1825).

Larus jamesonii, Wils. Ill. Orn. pl. xxiii. et descript. (1831).

[No. 131, ♂. } Raine Island, N. Australia. Eyes white; bill
No. 132, ♀. } coral, tip darker. Only a few about the island.]

From its larger size and the difference in the amount of white on the primaries of the adults, this form seems to be fairly separable from *L. scopulinus*, of New Zealand, and is undoubtedly distinct from its ally, *L. hartlaubi*, Bruch, of the Cape of Good Hope. Specimens from the *northern* portions of Australia are much wanted; and these two examples are therefore of unusual value.

14. LARUS DOMINICANUS, Licht.

Larus dominicanus, Licht. Verz. d. Doubl. p. 82 (1823).

[1 specimen. Christmas Harbour, Kerguelen Island.

No. 683, ♂. Nassau Harbour, Straits of Magellan, January 11th–13th, 1876. Eyes grey; bill yellow; angle of lower mandible red.]

1 egg from Kerguelen Island } The latter partake rather more of the
2 eggs from Elizabeth Island, } bold markings characteristic of the
Straits of Magellan. } eggs of *L. marinus* than the former.

Two adult specimens. I can detect no specific difference between the examples of this form, which ranges from New Zealand to South Africa, and thence to the extra-tropical portions of South America.

15. STERCORARIUS ANTARCTICUS (Less.).

Lestris antarcticus, Less. Traité d'Orn. p. 616 (1831).

Stercorarius antarcticus, Saunders, P. Z. S. 1876, p. 321.

[1 specimen. Inaccessible Island, Tristan d'Acunha, October 16th, 1873.

1 specimen. Christmas Harbour, Kerguelen Island, January 1874.

No. 732, ♀. Falkland Islands, January–February 1876. Eyes hazel.]

The two former are of the usual dusky colour; the last shows the

pale yellow acuminate feathers on the collar, which are rarely absent in specimens from the Falklands.

16. STERCORARIUS CHILENSIS, Bp.

Lestris antarcticus, var. *c*, *chilensis*, Bp. Consp. Av. ii. p. 207 (1857).
Stercorarius chilensis, Saunders, P. Z. S. 1876, p. 323.

[No. 718, ♂. Elizabeth Island, Straits of Magellan, January 18th, 1876. Eyes brown; stomach had fish &c.]

A freshly moulted but somewhat immature specimen. Hitherto no examples of this well-marked form have been obtained beyond the eastern exit of the Straits of Magellan, its range being apparently to the westward and northward along the coast as far as the lat. 23° S. Since writing my notice of the *Stercorariinæ* (*loc. cit.*), I have had an opportunity of verifying the correctness of my opinions by the examination of Bonaparte's type in the Berlin Museum.

17. STERCORARIUS POMATORHINUS (Temm.).

Lestris pomarinus, Temm. Man. d'Orn. p. 514 (1815).
Stercorarius pomatorhinus, Newton, Ibis, 1865, p. 509; Saunders, P. Z. S. 1876, p. 324.

[1 specimen. Off Inosima, Japan, May 1875.]

A very fine adult bird, the golden tips to the feathers on the sides of the neck being very rich, and the dusky pectoral band being faint in the centre. This is quite a new locality for this species; for although its occurrence as a straggler once on the coast of Tenasserim, and once at Cape York, North Australia, would lead to the expectation that it would find its way downwards through the North Pacific, yet the only other locality on that side hitherto recorded is that of the Prybilov Islands, a long way to the N.W. The date, and the fact of this specimen being an adult, make this link in the chain of our knowledge of its geographical distribution particularly interesting.

10. Some additional Proof, if needed, of the Fact that the Red *Eclecti* are the Females of the Green ones. By Dr. A. B. MEYER, Director of the Royal Zoological Museum, Dresden. Communicated by the Secretary.

[Received 26th October, 1877.]

(Plate LXXIX.)

My assertion that the red *Eclecti* are the females of the green ones[1] did not at first meet with approval from many sides; but I suppose that now it begins to be looked upon as correct. Nevertheless it may not be superfluous to recur to the question, the more so as the facts which I have to record are much to the point.

Some time ago the Dresden Museum received a specimen of

[1] Verh. k. k. zool.-bot. Gesellsch. Wien, 1874, and Mittheilungen a. d. k. zool. Mus. Dresden, Heft i. 1875.

Fig. 1.

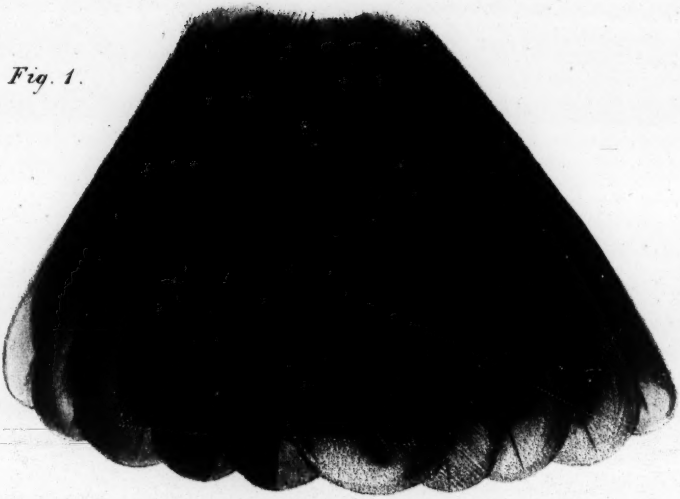


Fig. 2.



J.Smit lith. Hanhart imp.

TAIL OF ECLECTUS POLYCHLORUS.

2/3 n.s.



Eclectus polychlorus auct.[1] (C 3756 of the collection), which offers not the least deviation from a common specimen from New Guinea or Halmahera, except in the coloration of the tail-feathers: but just this coloration is very remarkable; viz. the left half of the tail and the under tail-coverts are partly coloured red, like the same parts in *Eclectus linnei*, as shown in the accompanying drawings (Plate LXXIX.), where fig. 1 represents the upperside, and fig. 2 the underside of the tail in the specimen.

It will be observed that one half of the tail in figs. 1 and 2 is coloured like the male, the other half like the female. In fig. 1, even a small red patch is to be seen on the right web of the middle rectrix; and in fig. 2 the edges of the inner web of the rectrices are reddish.

I had apparently strong evidence that the specimen in question came from Halmahera; but I am not able to distinguish the green specimen from Halmahera from the New-Guinea ones, notwithstanding the large series before me. It may be said that specimens from the islands Jobi and Mafoor appear to be somewhat darker, more bluish green than specimens from Halmahera and New Guinea, where this colour is a little brighter, or golden-tinged; but specimens from Halmahera and New Guinea are, in my opinion, not to be distinguished with certainty. I nevertheless do not doubt that the specimen in question comes from New Guinea and not from Halmahera, as the red parts on it correspond entirely with those of the red *Eclecti* from New Guinea, and not with those of the red ones from Halmahera, which have these parts of a yellowish colour.

I do not exactly know how to interpret this remarkable coloration. Is it something of a hermaphroditism? or is it the remains of the dress of the young male? The specimen is not an old one, the bill showing no traces of having been used very long; else one would perhaps suggest that it is a very old female, which has adopted the dress of the male, and where the red is the remains of the female plumage; but this last supposition is out of the question.

Formerly (*l. c.*) I discussed the question whether the young bird in both sexes is plain green or not; but I now believe that it is red in both sexes, *i. e.* bears the dress which the female keeps during its whole life. To this belief I came when I saw the specimen No. 22428 of the Berlin Museum (which Professor Peters kindly sent me for inspection), mentioned by Prof. Cabanis and Dr. Reichenow in the 'Journ. f. Ornithol.,' 1876, p. 324[2]) as a young male from New Britain. This is a green specimen, which has everywhere on the wing and its coverts dark purple-red patches of the colour which the female always has. These patches appear to be in dissolution, or fading away; and if this really is the case, and if the specimen is a normal one, we have the proof that the young male is

[1] This specimen was formerly in the Görlitz Museum, whose Curator, Dr. Peck, kindly transmitted it to the Dresden Museum; and I have to thank him cordially for his courtesy. Dr. Peck published a note on this specimen in the Sitzungsberichte of the Zoological Section of the Naturf. Ges. of Görlitz, 25th Jan. 1875.

[2] The remark made there is not quite intelligible, because, as I hear from Dr. Reichenow, the words "ist der junge Vogel" have been omitted after the word "Geschlecter."

coloured like the female—a fact which would be in accordance with numerous others in ornithology. These red patches in the Berlin specimen are chiefly in the middle of the webs, of which the edges are quite green. I will not and cannot decide whether this is the general mode of changing the colour, the specimen in the Dresden Museum, above described, having just the edges of the web still red, whereas the basal part is green.

Besides, one of the younger male specimens from New Guinea, which I collected myself (C 1306 of the Dresden Museum), has some faint traces of red on the secondaries—a fact which I had overlooked till now: this specimen is older than the Berlin one, as the coloration of the bill clearly proves; but it is still young; and I therefore doubt the less that the young male is always red like the female. That this has not been already shown by many specimens is a fact which I cannot sufficiently understand; besides, Dr. Beccari writes that the young ones offer the same differences as the adult birds (Ann. Mus. Gen. vii. 715).

At all events, whatever be the signification of these remarkable colorations, the specimens spoken of give very strong additional proof to my assertion *that the red* Eclecti *are the females of the green ones*[1].

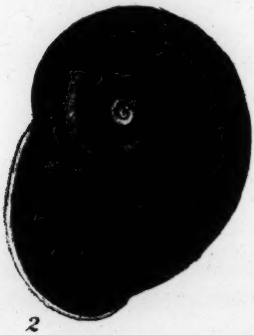
A short time ago Mr. Fiedler, of Agram, in the 'Orn. Centralblatt,' 1877, p. 87, reported that a green *Eclectus polychlorus*, dissected in his town, proved to be a female. I did not succeed in getting fuller particulars of this case, but have a suspicion that it will range among those to which Mr. Forbes, in his paper on *Eclectus* in 'The Ibis,' 1877, p. 281, alludes; and the Rev. George Brown's cases will perhaps come under the same head.

The "♂ ad." specimen, mentioned by Prof. Cabanis and Dr. Reichenow (*l. c.*) from New Britain, was brought over alive on the 'Gazelle,' died in Berlin, and was dissected by Prof. Peters; it proved to be a male, and it is a green individual.

Dr. Bolau has recently mentioned (Zool. Garten, 1877, p. 295) an *Eclectus linnei* from the Solomon Islands, which died in the Zoological Garden of Hamburg. He kindly informed me that it was a female, and is now in the Museum Godeffroy of that town. Mr. Schmeltz was so obliging as to send me the specimen for inspection (it is No. 14519 of that Museum); and I remark that not only are green spots to be seen on the tertiaries, but that also some of their inner webs are nearly entirely green. This specimen shows the red of the head and throat as well as the under tail-coverts tinged with yellowish, very different from the red in the specimens from New Guinea and the islands of Geelvink Bay. I do not know whether this is an individual variation, a consequence perhaps of the state of captivity,

[1] Count Salvadori mentions (Ann. Mus. Civ. Gen. vii. p. 756), on the authority of Signor d'Albertis, that this is a well-known fact in the Moluccas and New Guinea. If this is the case, it is to be wondered at that neither Wallace, nor Bernstein, nor Rosenberg, who all spent years in those regions, knew the Malay language well, and procured large series of males and females, nor any one else reported the well-known fact, or at least took the trouble to prove or disprove its truth.























G.Sowerby lith. Hanhart imp.

HELIX SEPULCHRALIS, AND IT'S ALLIES.

or whether all the Solomon-Island specimens show this obvious tint. Besides, the blue of the belly appears to be deeper, and some feathers have in certain lights a greenish shade.

11. Notes on the *Helix sepulchralis* of Férussac and its Allies; with Descriptions of two Species. By George French Angas, C.M.Z.S., F.L.S., F.R.G.S., &c.

[Received October 26, 1877.]

(Plate LXXX.)

The confusion that appears to exist amongst conchologists with regard to the nomenclature of certain land-shells from the island of Madagascar (hitherto passing as varieties of *Helix sepulchralis* of Férussac) has induced me to make a careful examination of this somewhat protean group of Snails. After having referred to all that authors have written concerning them, and inspected a very large series of specimens, I am of opinion that several species, each presenting certain constant and distinctive characters sufficient to justify their separation, have been mixed up under the general name of *sepulchralis*.

Férussac, in his 'Hist. Moll.,' first describes *Helix sepulchralis*, giving the diagnosis of the species as follows:—"H. *testa orbiculato-convexa, subdepressa, late umbilicata, glabra, castanea, subtus albo zonata, apice alba*; *labro valde expanso, intus albo, margine reflexo*."

The type shell is figured by Férussac on plate 75. fig. 1; and on plate 75 c there are given as varieties figs. 1–12. Pfeiffer, in the 'Monographia Heliceorum viventium,' also says *Helix sepulchralis* is "*late umbilicata*." Reeve, in the 'Conchologia Iconica,' describes the species as being *broadly* umbilicated, and on plate 39 of his Monograph of *Helix* gives three figures. The first of these, 147 *a*, represents the true *sepulchralis*; 147 *b* is a distinct shell, and has since been described and figured by Crosse in the 'Journal de Conchyliologie' for 1869, p. 391, plate 12. fig. 3, under the name of *Helix subsepulchralis*; whilst 147 *c* I regard as a third species, for which I propose the name of *Helix hova*.

Amongst the shells thus confused together under the general name of *sepulchralis*, there appear to me to be at least four separate species, all of which, though displaying, more or less, certain characters which I regard as belonging to the group, are yet easily recognizable at once as being distinct.

First comes the *Helix sepulchralis* proper (Plate LXXX. figs. 1, 2), the leading characters of which may be thus briefly noted. Shell double the size, or nearly so, of its allies; *widely* and *perspectively* umbilicated; spire very slightly raised; whorls with the concentric depression moderate, and carried through all the whorls to the apex; the upper surface of the body-whorl coarsely obliquely plicately malleated; colour either dark purplish chestnut, or pale olive-green inclining to violet near the apex, with occasionally a white band surrounding the umbilical region, but *never banded above*.

Secondly, *Helix subsepulchralis*, Crosse (Plate LXXX. fig. 3.). Shell much smaller and more solid; spire conical; whorls with the concentric depression and coarse plication absent; colour dark chestnut, with a narrow white band at the periphery and a broader one at the base; umbilicus more contracted, and non-perspective; umbilical region invariably of a dark colour; whilst the brown colouring shows on the interior of the lip. This is the shell figured by Reeve as *H. sepulchralis*, var. *b*.

Thirdly, I will briefly diagnose the shell figured as var. *c*. This appears, on the examination of many specimens, quite distinct from the *H. subsepulchralis* of Crosse. The shell is about the same size, but less conical; the umbilicus is more contracted; there is a faint development of the depression on the upper part of the last whorl; the painting invariably consists of three broad chestnut zones on a pale yellowish-olive ground; and the umbilical region is constantly of a light colour. For this species I propose the name of *H. hova*.

Fourthly comes another shell, equally distinct, somewhat larger than the last two, but never attaining the size of the true *sepulchralis*, from which it differs also in form, being less flattened and more compact; it wants the oblique plications, but has the concentric depression strongly developed, the lower edge of it being bounded by a prominent elevated keel; the base is very tumid in front, and forms a kind of abrupt carina bordering the *pinched* and *contracted* umbilicus. The colouring varies from dark chocolate-brown to pale green, banded with brown zones, whilst the umbilicus is almost invariably encircled by a light or dark band, sometimes by both. One marked character of this species is the freckled, diaphanous, more or less zigzag ornamentation of the epidermis, which gives to the shell a beautiful appearance, and is never discernible in *H. sepulchralis*. The species, of which there is a bad figure in Férussac (pl. 75 *c*. figs. 6, 7), I propose to call *Helix sakalava*.

HELIX HOVA, n. sp. (Plate LXXX. figs. 4, 5.)

Shell moderately umbilicated, depressedly conical, rather solid, under the lens extremely finely shagreened, greenish yellow with three broad chestnut bands; whorls $4\frac{1}{2}$, rather convex, the depression on the upper surface of the last whorl very slight; base rounded, with a moderate excavation round the umbilicus, which is somewhat contracted and non-perspective; aperture oblique, quadrately ovate, white within; outer lip moderately expanded and reflexed, pure white; margin joined by a thick white callus.

Diam. maj. 1 in. 5 lines, min. 1 in., alt. 10 lines.

Hab. Madagascar.

HELIX SAKALAVA, n. sp. (Plate LXXX. figs. 6–11.)

Shell umbilicated, orbicular, moderately solid, very minutely irregularly granulated above and below, chestnut, with a pale band surrounding the umbilical region, and more or less freckled throughout with angular or zigzag ochraceous diaphanous markings; spire very slightly raised, apex obtuse; whorls $4\frac{1}{2}$, rapidly increasing, the last

whorl large and inflated, impressed on the upper part with a broad concentric groove, the lower edge of which is bordered by a blunt prominent rib or keel just above the periphery, and with an obtuse tumid carina below surrounding the umbilicus, which is somewhat small, contracted, and non-perspective; aperture oblique, quadrately ovate, white or very pale ash-colour within; outer lip thickened, expanded and sharply reflexed, somewhat angularly dilated and obsoletely toothed in the middle, white; margins approximating, joined by a moderate callus.

Average diam. maj. 1 in. 6 lines, min. 1 in. 2 lines, alt. 9 lines.

Hab. Madagascar.

Var. *a*. Shell entirely white, with a pale olive-yellow epidermis.

Var. *b*. Shell pale green, with three brown bands, and freckled with light diaphanous markings.

Var. *c*. Shell pale yellowish olive, irregularly painted with longitudinal brown flames, and with the typical band round the umbilicus.

The specimens figured are selected from a fine series of Madagascar shells in the collection of Sir David Barclay, Bart.

EXPLANATION OF PLATE LXXX.

Figs. 1, 2. *Helix sepulchralis*, Fér., p. 803.
3. —— *subsepulchralis*, Crosse, p. 804.
4, 5. —— *hova*, Angas, p. 804.
6–11. —— *sakalava*, Angus, p. 805.

December 4, 1877.

Prof. A. Newton, F.R.S., in the Chair.

The following report on the additions to the Society's Menagerie during the month of November 1877 was read by the Secretary:—

The total number of registered additions to the Society's Menagerie during the month of November 1877 was 75, of which 3 were by birth, 34 by presentation, 26 by purchase, 3 by exchange, and 9 were received on deposit. The total number of departures during the same period, by death and removals, was 99.

The most noticeable additions during the month were:—

1. A three-banded Armadillo (*Tolypeutes tricinctus*), from Brazil, purchased November 3rd. Of this scarce form of Armadillo, remarkable for its possession of the faculty of rolling itself up into a ball, we have had no living example since 1865.

2. A young example of Brown Pelican of the West Indies (*Pelecanus fuscus*), purchased Nov. 16th. This Pelican is seldom met with in captivity; and we have had no examples of it in our collection since we lost those described and figured in the Society's 'Proceedings,' 1868, p. 268, pl. xxv.

3. A Brown Tree-Kangaroo (*Dendrolagus inustus*), purchased November 19th. Of this rare animal we have received no specimen since 1865. The present example was obtained from M. Léon

Laglaize, who brought it back with him from his recent successful expedition to New Guinea.

4. An example of the Maned Fox of South America, or Brazilian Wolf (*Canis jubatus*), purchased Nov. 30th. Of this remarkable carnivore no specimen, so far as I know, has been previously brought alive to Europe; and it is even a desideratum in many museums.

Our example, which is young, probably not quite full-grown, was obtained for the Society through the agency of Mr. Petty, of Buenos Ayres, who states that it is the only specimen he has met with in captivity during many years in which he has been in the habit of interesting himself in living animals. The figure of Burmeister (Erläut. zur Fauna Brasiliens, p. 25, pl. xxi.) does not quite agree with our individual, which, as will be seen by the drawing now exhibited (Plate LXXXI.), is of a nearly uniform foxy brown colour, and has the interior of the large ears densely clothed with woolly hairs.

Mr. Henry Seebohm exhibited some of the rarer eggs and birds which he obtained on his recent visit to the arctic regions of the Yen-e-say in East Siberia, and gave a rapid sketch of his journey.

Amongst the eggs which he exhibited were those of *Turdus pallens*, *Phylloscopus borealis*, *P. tristis*, *P. superciliosus*, *Accentor montanellus*, *Emberiza pusilla*, *Charadrius longipes*, *Tringa minuta*, *Anser ruficollis*, and *Cygnus bewickii*.

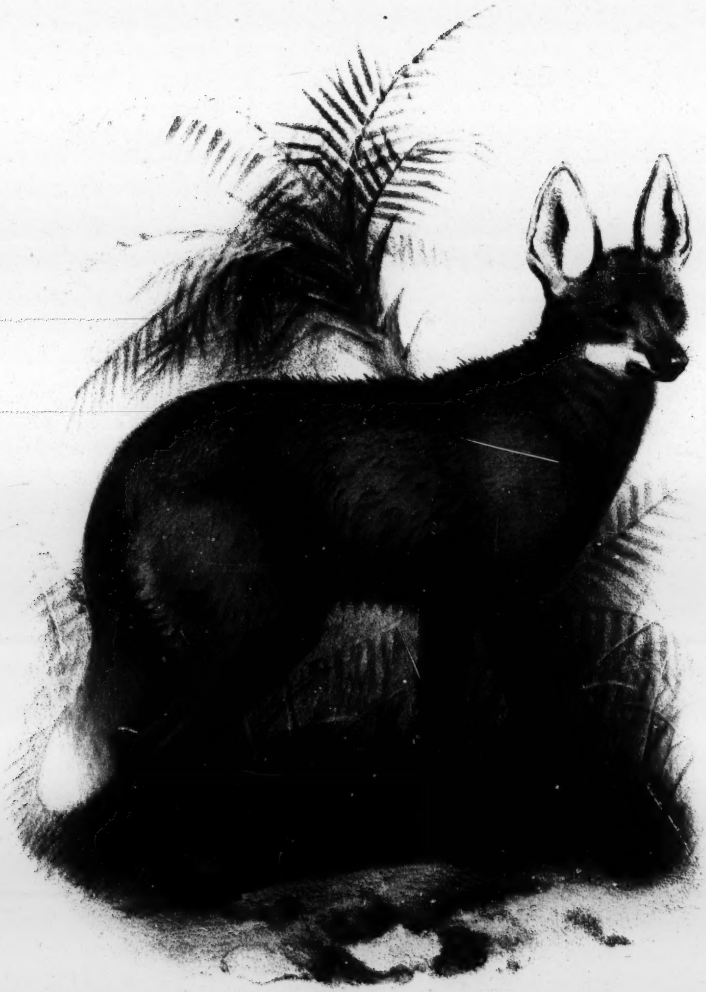
Some of the most interesting skins were those of birds in immature plumage, *e. g.*:—young in down of *Charadrius longipes*; young in first plumage of *Turdus iliacus*, *T. pilaris*, *T. fuscatus*, *T. atrigularis*, *T. pallens*, *Emberiza pusilla*, and *Anthus richardi*.

He also exhibited young in first plumage of *Locustella certhiola* (Pallas, nec Middendorff), and pointed out the identity of this species with *L. rubescens* of Blyth, *L. doriæ* of Salvadori, and probably with *L. minor* of David and Oustalet.

He also pointed out that *L. ochotensis* of Middendorff (of which he had examined the types in the St. Petersburg Museum) was not a good species, being the young in second plumage of *L. certhiola* (Midd. nec Pall.). Of this species he exhibited two specimens of the adult—one from Kamchatka, the type of *L. subcerthiola* of Swinhoe, and a second skin from Urup Isla, south of Kamchatka,—and a specimen of the young in second plumage, the type of *Arundinax blakistoni* of Swinhoe (Ibis, 1876, p. 332, pl. viii. fig. 1).

Mr. Seebohm also stated that an examination of the skins of certain *Acrocephali* in the St.-Petersburg Museum, collected by Prjevalsky in the valley of the Ussuri, in Swinhoe's collection, obtained by him in China, and in the collections of Lord Tweeddale and the British Museum, obtained by Wallace and others in the islands of the Malay archipelago, had convinced him that *Acrocephalus fasciolatus* of Gray and *Calamoherpe subflavescens* of Elliot were identical, and were the young in second plumage of *Acrocephalus insularis* of Wallace, of which *Calamoherpe fumigata* of Swinhoe is a synonym.

He also exhibited a series of hybrids between *Corvus corone* and *C. cornix*, which habitually interbreed in the valley of the Yen-e-say.



J.Wolf del. J.Smit lith. Hanhart imp.

CANIS JUBATUS.



Other skins were principally interesting as extending our knowledge of geographical distribution, such as those of *Phylloscopus trochilus* and *Acrocephalus schœnibœnus* from long. 88° E., *Anthus gustavi* of Swinhoe (=*A. seebohmi* of Dresser, =*A. batchianensis* of Gray) from the same longitude, and young birds in first plumage of this species from the Kurile Islands.

Mr. W. Saville Kent, F.Z.S., exhibited the plans of a Zoological Station and Museum and Institute of Pisciculture to be established at St. Helier's, Jersey, of which he was the originator. The object sought in the establishment of this institution was the provision within British waters of facilities for pursuing marine biological investigations similar to those which exist at the Naples Aquarium and Zoological Station, and at the Anderson School of Natural History at Penikese Island, Buzzards Bay, U. S. A.

The Secretary exhibited on the part of Mr. A. Anderson, F.Z.S., one of the spotted eggs of *Ascalaphia coromanda* referred to by him at p. 316 of the Society's 'Proceedings' for 1876. Mr. Anderson was of opinion that Owls laying such remarkably well-marked eggs was one of the most extraordinary facts in oology he had heard of. He regretted that the companion egg, which was equally well marked, had been left by an oversight in India.

The Secretary also exhibited on the part of Mr. A. Anderson, F.Z.S., the young of *Rhynchops albicollis* and *Seena aurantia* on first exclusion from the egg-shells, these chicks having been hatched in Mr. Anderson's own house along with a number of others.

Mr. Anderson drew attention to the fact that there was no appreciable difference between the bills of the two species at this early stage, so that the extraordinary scissor-shaped bill of *Rhynchops albicollis* must be developed when the bird is in a state of adolescence.

Mr. Anderson had never yet succeeded in procuring one of these birds showing the partially developed bill, owing to their habit of keeping well in the centre of large rivers, and of secreting themselves on islands, sandbanks, and drift-wood on the first approach of danger.

The Secretary also exhibited on the part of Mr. A. Anderson, F.Z.S., portions of the skins of the parent Grebes (*Podiceps cristatus*), together with two of the nestling birds in a downy state, the nidification of which had been described by him in 'Stray Feathers,' vol. iii. p. 274.

Mr. Anderson was of opinion that it was the extraordinary heavy rainfall during that year that had induced some of these birds to linger in the plains of the North-west Provinces for the purpose of breeding. Still he considered it likely enough that a few pairs regularly nested in the Oudh tarai, and on some of the larger sheets of water in Bundelkhand, where the country had not yet been thoroughly explored during the rainy season.

The following papers were read:—

1. On the Capture of a Specimen of Risso's Grampus at Sidlesham, near Chichester. By Henry Lee, F.L.S., F.Z.S., &c.

[Received November 20, 1877.]

In the publications of the Zoological Society are to be found so many valuable notices of the occurrence on the coasts of Great Britain of some of the rarer Whales that I feel I ought, as one of its Fellows, to have communicated to the Society before now the capture of a specimen of Risso's Grampus more than two years ago not far from Chichester.

On the 26th of July, 1875, a "large porpoise" was seen to be embayed in shallow water at Sidlesham, near Chichester; and a party of men succeeded in cutting off its retreat seaward, and driving it in shore. As the tide receded, it was left swimming in a deep pool; and its captors, after fastening a line with cork floats to its tail to mark its "whereabouts," telegraphed to Brighton information of its arrival. On the following morning an official from the Aquarium took charge of it, and it was conveyed alive to one of the large tanks there. Unfortunately, however, it only survived for twenty-four hours.

Being in a different part of the country at the time, I had not the pleasure of seeing it alive; and when I was able to examine it it was in the hands of Mr. Brasenor, the taxidermist. I was greatly pleased, however, to find that this "bull-head porpoise," as the local fishermen called it, was a Grampus of a species extremely rare in Britain—namely, *Grampus griseus* of Cuvier (which Professor Flower and others regard as identical with Risso's Grampus) and *G. cuvieri* of Dr. Gray. Only three specimens are known to have been previously taken on the English, and eight on the French coasts. In the stomach were many horny beaks of the common Squid (*Loligo vulgaris*) and twelve small stones.

The distinctive characters and measurements of this animal were as follows:—

Vertebræ.—Cervical 7, dorsal 12, lumbar and caudal 49; total 68.

Ribs.—12.

Teeth.—None in the upper jaw; in the lower jaw four on each side, on the anterior part of the ramus, separate, conical, acute, curved inward (especially towards the crown). Dental formula $\frac{0.0}{4.4}$.

Dimensions.

	ft.	in.
Total length	8	0
Girth, in front of dorsal fin	3	8
From upper lip to anterior edge of dorsal fin (following curve)	3	7
From upper lip to blowhole (following curve)	1	4
From upper lip to junction of anterior edge of pectoral fin with body	1	7

	ft.	in.
Anterior edge of upper lip to angle of mouth ..	0	9½
Length of eye-aperture..	0	1
Pectoral fin; length from junction of anterior edge with body to tip	1	2
Pectoral fin, from junction of posterior edge with body to tip	0	11
Pectoral fin, breadth at base	0	5
Dorsal fin, height in perpendicular line	0	9
Dorsal fin from base to tip, following curve of anterior edge	1	6
Breadth of caudal fin	1	9

Sex.—Male.

The number of vertebræ is precisely the same as that given by Professor Flower as found in an individual of this species, 10 feet long, taken in a mackerel-net near the Eddystone Lighthouse, on the 28th of February, 1870; and also exactly coincides with the number found by M. Fischer in a specimen of *Grampus griseus*, 9 feet 2 inches long, stranded in 1867 on the coast of La Gironde, France, and taken to Arcachon.

Although the absence of teeth in the upper jaw is constant and persistent, the dentition in the lower jaw varies considerably in this species. In Cuvier's specimen, described by him as *Delphinus griseus* from a skeleton and drawing sent to the Paris Museum from Brest, there were only two teeth on each side of the mandible, all much worn. In M. Fischer's specimen, already referred to, the dentition was the same as that of our Brighton Grampus; and of four others mentioned by D'Orbigny as having been stranded near l'Aiguillon, La Vendée, and recognized by F. Cuvier as identical with the Brest specimen, one, a young one 7 feet long, had the same number of teeth, namely four on each side of the lower jaw; whilst two older ones had respectively six and seven, blunt, carious teeth similarly placed. In Professor Flower's adult individual, there were $\frac{0.0}{3.3}$. If the identity of "Risso's Dolphin" with *Grampus griseus* be accepted, the variation extends even to $\frac{0.0}{7.7}$.

The colour of our Grampus from Sidlesham was the same as of those described by D'Orbigny, and of the specimen which ran aground, in the Isle of Wight, in the spring of 1843, the skull of which is in the British Museum—namely, bluish-black above and dirty white beneath. From the prevalent colour of this Isle-of-Wight specimen being black and not grey, Dr. J. E. Gray changed its specific name to "*cuvieri*," considering that the word *griseus* gave a wrong impression of the animal, and that Cuvier was induced to call it so by the bad colouring of the drawing sent to him.

Professor Flower has so fully described this species and every thing of interest relating to it in his very complete and elaborate paper published in the 'Transactions of the Zoological Society,' vol. viii. part 1, March 1872, that I need only refer, for further information, to that admirable memoir.

2. On a Collection of Lepidoptera made in Northern Formosa by H. E. Hobson, Esq. By Arthur Gardiner Butler, F.L.S., F.Z.S., &c.

[Received November 13, 1877.]

Through the kindness of Dr. Lockhart, I have recently had the pleasure of examining a collection of Lepidoptera sent home by Mr. Hobson, who has generously permitted me to select, for the national collection, those species which we required.

In 1866 Messrs. Wallace & Moore published, in the 'Proceedings' of this Society, a list of the Lepidoptera taken by Mr. Swinhoe at Takow: of the forty-six butterflies there enumerated seventeen only have reappeared in the present series; and some of these will not be recognized as the same, owing to changes which have arisen in the nomenclature of the Butterflies and in the views now held by many lepidopterists of the localized character of the so-called variations of certain species.

RHOPALOCERA.

NYMPHALIDÆ.

Danainæ, Bates.

Danais, Latreille.

1. Danais plexippus.

Papilio plexippus, Linn. Mus. Lud. Ulr. p. 262 (1764).
Several examples.

2. Danais chrysippus.

Papilio chrysippus, Linn. Mus. Lud. Ulr. p. 263 (1764).
Two or three specimens.

3. Danais melaneus.

Papilio melaneus, Cramer, Pap. Exot. 1, pl. 30. D (1775).
One example.

4. Danais tytia.

Danais tytia, Gray, Lep. Ins. Nep. p. 9, pl. 9. fig. 2 (1846).
One example.

5. Danais similis.

Papilio similis, Linn. Mus. Lud. Ulr. p. 299 (1764).
Tolerably common.

Terpsichrois, Hübner.

6. Terpsichrois midamus.

Papilio midamus, Linn. Mus. Lud. Ulr. p. 251 (1764).
Two or three specimens.

Euplœa, Fabricius.

7. Euplœa swinhoei.

Euplœa swinhoei, Wallace, Proc. Zool. Soc. 1866, p. 358.

A pair of this beautiful and rare species.

Salpinx, Hübner.

8. Salpinx hobsoni, n. sp.

♂. Allied to *S. vestigiata*, but darker and more brilliantly shot with purple, primaries with the *submarginal blue spots of about four times the size*; costal spot smaller, elliptical interno-median spot similar; *secondaries considerably darker*, excepting at anal angle, as dark and brilliantly purple-shot as the primaries, costal area greyish sericeous; cuneiform subcostal patch clearer and brighter in colour; three submarginal spots towards the apex, the uppermost one white, *the two others bright blue*: expanse 3 inches 6 lines.

A single fine male.

This species is, at first sight, so manifestly distinct from *S. vestigiata* that I feel no hesitation in characterizing it from a single example.

Satyrinæ, Bates.

9. Melanitis ismene.

Papilio ismene, Cramer, Pap. Exot. 1, pl. 26. A, B (1775).

Several specimens.

Elymniinæ, Kirby.

10. Elymnias nigrescens.

Elymnias nigrescens, Butler, P. Z. S. 1871, p. 520, pl. xlii. fig. 1.

One shattered example.

This is the common *Elymnias* of Malacca.

Nymphalinæ, Bates.

11. Athyma zoroastres, n. sp.

Allied to *A. cama*, from Silhet, the male without the rufous discoidal streak in primaries; the white belt of secondaries broader above, below slightly contracted from the middle to the abdominal margin; ground-colour below altogether greyer, the pearly spots and belt of secondaries narrower and less clear; female above with all the pale tawny belts of little more than half the width, below with the same differences as in the male: expanse, ♂ 2 inches 3 lines, ♀ 3 inches.

A pair.

12. Athyma leucothoë.

Papilio leucothoë, Linnæus, Mus. Lud. Ulr. p. 292 (1764).

Common.

13. DIADEMA MISIPPUS.

Papilio misippus, Linnæus, Mus. Lud. Ulr. p. 264 (1764).

Not uncommon.

An interesting male variety, approaching the female in coloration, occurs in the collection.

14. DIADEMA KEZIA, n. sp.

Allied to *D. philippensis*, but with the spots of the postmedian fascia of primaries well separated, smaller, and in an angular series, the primaries less brilliantly shot with blue, the submarginal spots of secondaries less sharply defined; wings below with all the white spots smaller, the large spot on the costa of secondaries being no larger than the other spots of the discal series; this series on both surfaces of all the wings continuous, not interrupted by the postmedian fascia of primaries: expanse, ♂ 3 inches, ♀ 3 inches 3 lines.

Common.

This is probably the *Diadema auge* of Wallace's list; we have five examples in the collection of the British Museum; there are others in Mr. Hobson's series; and I have seen several in private collections.

15. DIADEMA PRISCILLA, n. sp.

♀. Allied to *D. avia* (*jacintha*, Drury), but the primaries less falcated, all the wings darker, deep chocolate-brown; the primaries with a lustrous trifid blue patch beyond the cell (instead of the four blue spots of *D. avia*), a large bifid white subapical spot commencing the discal series; submarginal spots small and indistinct, otherwise as in *D. avia*; secondaries with all the spots white, the submarginal series, of small semicircular or conical spots, followed near the margin by a series of diverging linear white markings: wings below also darker, with similar differences to those on the upper surface (of course with no blue spots or patches); external angle of primaries blackish, disk of all the wings with scarcely perceptibly paler band: expanse 4 inches 3 lines.

One female.

This species is still nearer to the Bornean form, which, however, has not yet been described, so that I am compelled to compare it with the Indian one.

16. NEPTIS EURYNOME.

Limenitis eurynome, Westwood, Donov. Ins. China, pl. 37. fig. 3 (1842).

Several specimens.

17. JUNONIA ALMANA.

Papilio almana, Linnæus, Mus. Lud. Ulr. p. 272 (1764).

Common.

18. JUNONIA ASTERIE.

Papilio asterie, Linnæus, Syst. Nat. i. 2, p. 769 (1766).

One specimen.

19. JUNONIA ORITHYIA.

Papilio orithyia, Linnæus, Mus. Lud. Ulr. p. 278 (1764).

Several examples.

20. VANESSA ANGELICA.

Papilio angelica, Cramer, Pap. Exot. iv. pl. 388. G, H (1782).

One example.

21. CYRESTIS THYODAMAS.

Cyrestis thyodamas, Boisduval, Cuv. Règne Anim. Ins. ii. pl. 138. fig. 4 (1836).

One female.

The single specimen in the collection is smaller than the average of Indian examples; it is also slightly darker, but does not differ in marking.

22. PYRAMEIS CALLIRHOË.

Hamadryas callirhoë, Hübner, Samml. exot. Schmett. (1806–16).

One or two specimens.

23. PYRAMEIS CARDUI.

Papilio cardui, Linnæus, Faun. Suec. p. 276 (1761).

One specimen.

24. ARGYNNIS NIPHE.

Papilio niphe, Linnæus, Syst. Nat. i. 2, p. 785 (1766).

Two or three specimens.

25. MESSARAS ERYMANTHIS.

Papilio erymanthis, Drury, Ill. Exot. Ent. i. pl. 15. figs. 3, 4 (1773).

Common.

PAPILIONIDÆ.

PIERINÆ, Swainson.

26. TERIAS HECABE.

Papilio hecabe, Linnæus, Mus. Lud. Ulr. p. 249 (1764).

Several examples.

27. TERIAS ÆSIOPE.

Terias æsiope, Ménétriés, Cat. Mus. Petr. Lep. 1, pl. 2. fig. 3 (1855).

Several examples.

28. CATOPSILIA CHRYSEIS.

Papilio chryseis, Drury, Ill. Exot. Ent. pl. 12. figs. 3, 4 (1770).

Several examples.

29. Catopsilia nephte.

Papilio nephte, Fabricius, Ent. Syst. iii. p. 190. n. 588 (1793).
Two females.

Possibly a local variation of the preceding species; it is much larger than *C. pyranthe*, with which I have associated it in my monograph of the genus.

30. Catopsilia pyranthe.

Papilio pyranthe, Linnæus, Syst. Nat. ii. 1, p. 763 (1766).
Var. *Papilio ilea*, Fabricius, Ent. Syst. Suppl. p. 421 (1798).
Both forms of this species.

31. Catopsilia gnoma.

Papilio gnoma, Fabricius, Syst. Ent. App. p. 828 (1775).
One female.

32. Hebomoia glaucippe.

Papilio glaucippe, Linnæus, Mus. Lud. Ulr. p. 240 (1764).
One example.

33. Appias formosana.

Pieris formosana, Wallace, Proc. Zool. Soc. 1866, p. 356.
One male.

Papilioninæ, Bates.

34. Papilio sarpedon.

Papilio sarpedon, Linnæus, Mus. Lud. Ulr. p. 196 (1764).
One or two specimens.

35. Papilio erithonius.

Papilio erithonius, Cramer, Pap. Exot. iii. pl. 232. A, B (1782).
Common.

36. Papilio xuthus.

Papilio xuthus, Linnæus, Syst. Nat. i. 2, p. 751 (1766).
Common.

37. Papilio pammon.

Var. *P. borealis*, Felder, Wien. ent. Mon. vi. p. 22. n. 2 (1861).
Several specimens.

38. Papilio maackii.

Papilio maackii, Ménétriés, Bull. Acad. Pét. xvii. p. 212 (1859).
One shattered example.

39. Papilio demetrius.

Papilio demetrius, Cramer, Pap. Exot. iv. pl. 385. E, F (1782).
Two shattered examples.

HESPERIIDÆ.

40. PAMPHILA MATTHIAS.

Hesperia matthias, Fabricius, Ent. Syst. Suppl. p. 433 (1798).

One or two specimens.

41. PLESIONEURA FOLUS.

Papilio folus, Cramer, Pap. Exot. iv. pl. 74. F (1779).

Several specimens.

This list of Diurnal Lepidoptera, taken in conjunction with that of Mr. Wallace in 1866, brings the number of Formosan butterflies up to 70: there is, however, little doubt that in a year or two we shall be able to add greatly to this number.

HETEROCERA.

SPHINGIDÆ.

MACROGLOSSINÆ.

42. MACROGLOSSA PROXIMA?

Macroglossa proxima, Butler, P. Z. S. 1875, p. 4, pl. i. fig. 1.

One rather rubbed specimen.

CHÆROCAMPINÆ, Butler.

43. CHÆROCAMPA SILHETENSIS.

Chærocampa silhetensis, Walker, Lep. Het. viii. p. 143 (1856).

One specimen.

44. CHÆROCAMPA JAPONICA.

Chærocampa japonica, Boisduval, Lép. Jap. p. 36 (1869).

Two examples.

ARCTIIDÆ.

45. AREAS LACTINEA.

Phalæna lactinea, Cramer, Pap. Exot. ii. pl. 131. D (1779).

One specimen.

LITHOSIIDÆ.

HYPSINÆ, Butler.

46. HYPSA ZEBRINA, n. sp.

Allied to *H. dama*, but the thorax brownish above, the black transverse bands on the abdomen narrower, primaries more glossy and without the white veins, black spots at the base larger, longitudinal claviform white streak more regular: expanse, ♂ 2 inches 7 lines, ♀ 2 inches 6 lines.

A pair.

H. dama is a species only found in the Australian Region.

CHALCOSIIDÆ.

47. CHALCOSIA DIANA, n. sp.

Allied to *C. idæoides*, but the veins and borders distinctly bluer,

bright ultramarine in certain lights, the subapical spots of primaries united into a continuous band, the postmedian band broader, the basal two fifths of interno-median interspace and the base of the cell white; secondaries with one or two white spots on the border; vertex of head and collar bright carmine, not spotted with green as in *C. idæoides*; abdomen bright metallic bronze-coloured, not pale metallic green: expanse, ♂ 2 inches, ♀ 2 inches 2 lines.

Several examples.

This species is smaller than *C. idæoides*, and somewhat more nearly allied to an undescribed species which Mr. Moore proposes to call *C. argentata*.

LIMACODIDÆ.

48. ANZABE SINENSIS.

Anzabe sinensis, Walker, Lep. Het. v. p. 1093 (1855).

One example.

HYPOPYRIDÆ.

49. SPIRAMA RECTIFASCIATA.

Spiramia rectifasciata, Ménétriés, Cat. Mus. Petrop. iii.

One example, a male.

OPHIUSIDÆ.

50. OPHIUSA FULVOTÆNIA.

Ophiusa fulvotænia, Guénée, Noct. iii. p. 272. n. 1710.

One poor example.

3. Contributions to the Ornithology of the Philippines.—No. III. On the Collection made by Mr. A. H. Everett in the Island of Mindanao. By ARTHUR, Marquis of TWEEDDALE, F.R.S., President of the Society.

[Received December 3, 1877.]

(Plates LXXXII.–LXXXV.)

Visited by the French naturalist Sonnerat some 106 years ago, the large Philippine island of Mindanao has continued to be almost a *terra incognita* to the zoologist ever since, while the little knowledge of its animals we possessed was restricted to those inhabiting a small portion of its southern and western limb or peninsula in the neighbourhood of the principal Spanish settlement of Zamboanga.

Dr. Steere and the naturalists of the 'Challenger' Expedition[1] added some 40 species to the previously known total of nineteen Mindanao birds; but their researches were likewise confined to the country in the neighbourhood of Zamboanga.

[1] Dr. Steere added some twenty-nine species, and the 'Challenger' Expedition eleven.



J.Smit lith. Hanhart imp.

LORICULUS HARTLAUBI, ♂.♀.



MULLERIPICUS FULIGINOSUS

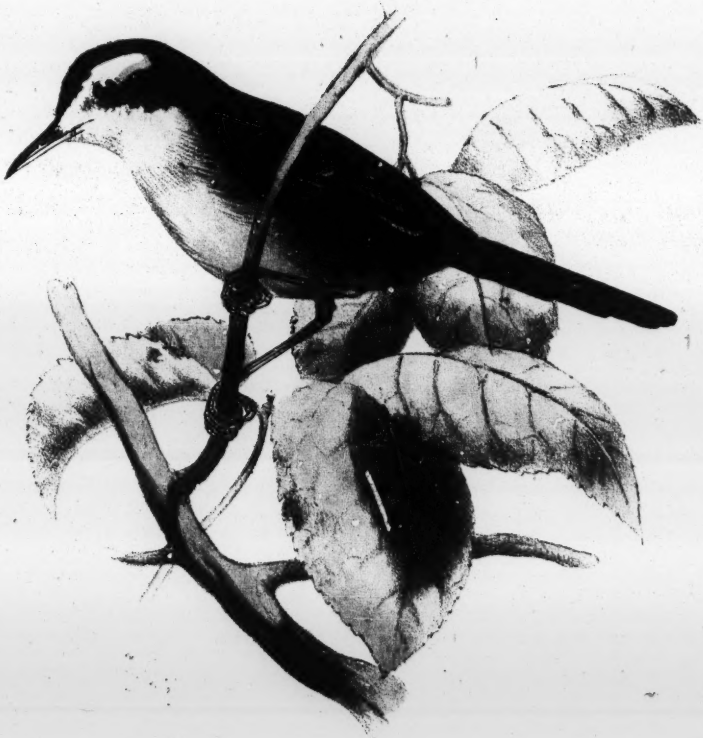
J Smit lith.

CRINIGER



Hanhart imp

NIGER EVERETTI



J.Smit lith. Hanhart imp.

ORTHOTOMUS NIGRICEPS.



Mr. Everett last May selected new ground, and proceeded to Butuan, on the Butuan river, in North Mindanao, and afterwards changed his station to Surigao, situated at the most northern point of the island, and then to Placer on the north-east side. At these three stations he collected eighty-one species of birds during part of the months of May, June, and July, and has thus largely added to our knowledge of the avifauna of this little-explored island. Mr. Everett in one letter states that his work has been much interrupted by the rains, in another that he has been working under numerous drawbacks—fever, constant heavy rains, and impossibility of getting regular supplies of ammunition. That, in spite of all his difficulties, he should have done so much, redounds all the more to his untiring zeal.

To the total of fifty-nine known Mindanao birds Mr. Everett has added forty-three. Of these nine are new to science:—

Tanygnathus everetti.
Mulleripicus fuliginosus.
Penelopides affinis.
Criniger everetti.
Orthotomus nigriceps.
Dicæum cinereigulare.
Æthopyga bella.
Anthothreptus griseigularis.
Leucotreron? incognita.

Three are new to the Philippine avifauna:—

Cisticola greyi.
Ægialites cantianus.
Limnocinclus acuminatus.

One, stated doubtfully to occur in some Philippine island, was not included in my list:—

Phlogœnas crinigera.

The number of species of birds now recorded from the island of Mindanao amounts to 99, from south-west Mindanao 59, and from north-east Mindanao 81. The grand total of birds inhabiting the Philippine area (as restricted by me) has been increased by Mr. Everett's researches to about 288.

1. Cacatua hæmaturopygia (1).

[Mouth of Butuan river, ♂, May. Iris dark brown; orbital skin white; bill lead-grey; feet grey. Placer, ♂ ♀, July.]

2. Prionoturus discurus (2).

[Surigao, ♂, June; Placer, ♂, July.]

3. Tanygnathus luconensis (3).

[Butuan, ♂, May; Surigao, ♂ ♀, May.]

4. Tanygnathus everetti.

Tanygnathus everetti, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 533 (December 1, 1877).

Tanygnathus sumatranus (Raffles), G. R. Gray, Hand-list, no. 8048, "Island of Sama."

♀. Whole head light green. Throat, breast, and abdominal

region the same, with an ochreous tint. Upper back and interscapulars dark green. First primary dark brown, very narrowly margined with green on outer web; remaining primaries brown, with the whole of the outer web green, and, towards the ends, some of the inner webs. Secondaries, and tertiaries above, green. All the wing-coverts green, narrowly margined with yellow. Quills underneath brown. Under wing-coverts green and yellowish green. Rectrices above green, like quills; below pale golden brown. Middle and lower back and uropygium deep torquoise-blue, not sky-blue. Upper tail-coverts green. Bill in dried skin white.

Wing 7 inches, tail 5, tarsus 0·75, bill from gape 1·00.

[Butuan, ♀, May. Iris orange.]

Only one example is sent by Mr. Everett; but while very close to *T. albirostris*, Wallace, of Celebes, it can be readily distinguished by the deep tone of the blue of the back and its smaller dimensions. An example from the Philippine island of Samar, obtained by Cuming, is in the British Museum, and is alluded to by Dr. O. Finsch (Pap. ii. p. 360) as being possibly *T. muelleri* of Celebes. Mr. Sharpe, who has compared *T. everetti* with Cuming's Samar example, writes:—"*T. everetti* certainly seems to me to be exactly the same species as the bird marked *T. sumatranus* by Gray. It has the same blue edgings to the interscapular feathers. Our bird has one side of the upper breast blue-edged, which yours has not." Mr. Sharpe adds that the British-Museum skin has the bill coral-red; so that probably this Philippine species, which is a representative form of *T. muelleri*, has either a red or a white bill, like the Celebesian species (conf. Walden, Tr. Z. S. viii. p. 31). The blue edgings on the upper breast of the Samar bird do not occur in *T. muelleri*.

5. Cyclopsitta lunulata (4).

[Butuan, ♂, May. Iris dark brown; bill black, the base of maxilla light grey; feet greenish.]

Seven examples from Surigao and three from Butuan are sent by Mr. Everett, and they cannot be specifically separated from Luzon individuals. Only one is marked ♀, and it has a lunated collar and crescentic markings on the lower back; some of the necklace-plumes blue on their under surface. Five examples are of adults (marked ♂) with blue collars, the lower back bright yellow-green and no crescentic markings. Four (marked ♂) are immature birds, with mixed blue and lunulated collars, and with traces, more or less, of crescentic markings on the lower back. These last examples establish the identity of *C. lunulata* and *C. loxias*; but the question whether the *lunulata* plumage belongs to adult females as well as to immature males still remains open. Some of the collar-plumes of the only female in the collection being blue underneath perhaps indicates a state of transition to the *loxias* dress. None of the adult males have the whole face, lores, and ophthalmic region blue, as is the case in two Luzon individuals killed in January.

6. Loriculus hartlaubi (7). (Plate LXXXII.)

Coryllis hartlaubi, Finsch, Papag. ii. p. 711.

? *Loriculus indicus* (Briss.); Souancé, var. A, ♂, Rev. et Mag. de Zool. 1856, p. 220, partim.

? *Loriculus cyanolæmus*, Bp. Tab. Uebers. d. Papag. no. 248, Naummania, 1856, Heft iv. ex Souancé, *l. c.*

? *Loriculus apicalis*, Souancé, *l. c.*

Loriculus melanopterus (Scopoli), G. R. Gray, List Psittacidæ B. Mus. p. 55 (1859), nec Scop.

Loriculus apicalis, Souancé, G. R. Gray, *t. c.* p. 56.

[Butuan, ♂ (immature), May. Iris brown; bill red-orange; feet orange. Placer, ♂ (nearly adult), July. Bill deep red; cere orange. ♂ (immature), July. Bill orange-red; cere light brown.]

The series consists of twenty-one examples of both sexes, the colour of the bill being red or orange-red in all. Ten are from Butuan, one from Surigao, four from Placer, and six from Dinagat[1].

When seen from above, every one of these twenty-one examples exhibits a similar distribution of markings and colour, the latter varying in intensity according to age, but not according to sex; so that all are readily to be recognized as belonging to one species. The whole top and back of the head is bright cherry-red, almost of the same shade as in *L. indicus*. The nape is pure golden-orange in adults of both sexes. The back is green, more or less washed with yellow, and in adults (♂ ♀) with golden. In all, the uropygium and upper tail-coverts are rich crimson. Adolescence in both sexes, when seen from above, is betrayed by the crown-feathers being green at their insertions and tipped with orange, instead of cherry-red, and by the back being pure green and not suffused with yellow, the uropygium being of a less intense crimson, mixed more or less with green.

Seen from below, two well-marked phases of plumage are represented, apart from the intermediate grades which characterize nonage. In one phase the cheeks, chin and upper throat, superciliaries, and lores are pale blue, the lower throat, breast, and abdomen light green or yellow-green. In the other phase the supercilium, lores, cheeks, chin, throat, and under surface generally are of a full sap-green, with the exception of a crimson, lengthened, pectoral plastron, quadrate below, and diminishing gradually to a narrow gular stripe, reaching almost to the chin. All the examples marked ♀ (6) belong to the first category, as well as some marked ♂ (5). All those with the crimson pectoral mark, or with the slightest trace of red on the breast or throat, are marked male. So distinct a species do the individuals falling under one or other of the two categories appear, that, were it not for several examples in the series marked ♂ exhibiting every gradation of the crimson pectoral mark, from a solitary crimson

[1] Although I propose to give in a future paper a separate account of the birds collected in Dinagat, it being a distinct Philippine island, it will be more convenient when treating of this little-known species to include the Dinagat examples.

plume to the fully developed plastron, it might be considered that two species were represented in the series. Three examples, marked ♂, with the crown obscure reddish green, have the face, chin, throat, and supercilium pale faded green, and not blue; these possess no indications of the red pectoral patch. Three other examples (♂), coloured above almost as brightly as an adult, have the lores, supercilium, cheeks, and chin blue, as in the female; but they betray their sex by a few scattered red plumes on the throat and breast. Were it not for these isolated plumes, the sex would be undeterminable by the plumage alone. In one of these three examples the blue chin- and face-feathers are passing over to bright green; and this example exhibits the greatest number of scattered red pectoral and gular plumes. In six other examples (♂), with the pectoral plastron fully developed or almost so, there is no blue about the chin and face.

If the six examples described above (marked by Mr. Everett as being of females) are in perfect plumage (and their upper plumage is not to be distinguished from that of undoubtedly adult males), the sexes in this species, when adult, have each a peculiar plumage. It was from either an adult female or else a young male with a blue face and chin, and before any red pectoral plumes had appeared, that Dr. O. Finsch described *L. hartlaubi*. Souancé's description of his *L. bonapartei* (R. et M. Zool. 1856, p. 222), a bird said to be a native of the Sooloo Islands, agrees in all respects with *L. hartlaubi* ♂ adult, the colour of the bill excepted, which is stated to be black. The adult male of *L. indicus* is difficult to distinguish from *L. hartlaubi* ♀ vel ♂ juv. But in the Ceylon bird the cherry-red of the head does not descend so low on the occiput, and the nape is not so intensely orange. The lower surface of *L. indicus* is pure light green and not yellow-green; the upper tail-coverts do not cover so much of the rectrices. The blue on the inner webs of the quills and on the under surface of the rectrices is much lighter in shade. *L. indicus* is also somewhat larger, and has a shorter and more powerful bill. Souancé's description of *L. indicus*, var. A, ♂ (*l. c.*), partly taken from examples in the Massena collection, said to be from the Philippines, may have been from Mindanao individuals of *L. hartlaubi* ♀ vel ♂ juv. But there is more reason now to infer that Souancé's species, 174 B (*L. apicalis*), said positively to be from Mindanao, was described from examples of either females or young males of *L. hartlaubi*. Souancé's remarks were comparative as between Ceylon and so-called Mindanao specimens, in which case the principal differentiating character of *L. apicalis*, and that which the title is meant to express, "l'extrémité des rectrices est colorée de bleu indigo," will hold good; for while in *L. indicus* the apices of the rectrices in most examples are light yellow-green, in several of Mr. Everett's specimens of *L. hartlaubi* they are dark blue, that darker shade of blue of the under surface of the rectrices which it has in common with *L. philippensis*, *L. chrysonotus*, and *L. regulus*. Souancé, moreover, was not sure that the apices of the rectrices in *L. indicus* contrasted with the general colour. By this view of the question Dr. Finsch's difficulty

(Papag. ii. pp. 718, 719) in recognizing *L. apicalis* is overcome. Yet a comparison of the type is desirable; and until made it is best to allow Dr. Finsch's title to stand. Mr. Sharpe has been good enough to compare one of Mr. Everett's examples (♀) with the British-Museum example from Mindanao, labelled by Gray *L. melanopterus*, and writes that it agrees[1]. The British-Museum example labelled *L. apicalis*, Mr. Sharpe informs me, is somewhat larger, though he "wonders the specimens have been separated."

7. Astur trivirgatus (11).

[Surigao, ♂, May. Iris golden yellow; orbital skin and cere greenish yellow; bill black, mandible whitish; legs dark chrome; claws black.]

Mr. J. H. Gurney informs me that this example belongs to true *A. trivirgatus*, *i. e.* the small race.

8. Spilornis holospilus (16).

[Butuan, ♂, May. *b.* Surigao, ♀, May.]

9. Haliastur intermedius (17).

[Mouth of Butuan river, ♀. Iris brown; bill, cere black mottled with yellow; feet pale greenish yellow; claws black.]

In first plumage.

10. Pernis ptilorhyncha.

Falco ptilorhynchus, Tem. Pl. Col. t. 44.

[Butuan, ♀, May. Iris white; bill black; cere mottled with yellow; feet chrome-yellow; claws black.]

The only example sent is in immature transition plumage. The entire under surface is tawny rufous, each feather with a bold dark-brown mesial stripe. Above the new feathers are brown, the old brown with broad fulvous or pale rufous margins. Mr. J. H. Gurney has been good enough to compare this Butuan individual with a Philippine example in the Norwich Museum, and has expressed his opinion that it is necessary to wait for more specimens before the question of its non-identity with *P. ptilorhyncha* can be decided.

11. Thriponax javensis (28).

[Surigao, ♀, May. Iris Naples-yellow.]

12. Mulleripicus fuliginosus. (Plate LXXXIII.)

Mulleripicus fuliginosus, Tweeddale, Ann. & Mag. N. H. ser. 4, xx. p. 534 (December 1, 1877).

♂. Slaty smoke-grey. Feathers of the forehead, vertex, occiput, chin, throat, and neck with a terminal white or fulvous-white linear mark. Lores, ear-coverts, and ophthalmic region uniform grey. Feathers covering basal walls of mandible and the cheeks crimson.

Wing 6·25 inches, tail 5·25, culmen 1·70, tarsus 1·00.

[1] The specimen on which Dr. Finsch founded his title of *C. hartlaubi*.

[Surigao, ♂, May. Iris Naples yellow; bill whitish horn-colour; feet dirty greenish.]

This species may be readily distinguished from *M. funebris*, its nearest ally, by being slaty grey and not almost black, by the cheeks only being red (♂) and not the sides of the head, forehead, and vertex, by the red colour being crimson and not mulberry-red, and by the form of the white marks at the tips of the gular, occipital, and nuchal feathers being linear and not round.

13. Chrysocolaptes lucidus (32).

Anteà, p. 539. no. 5.

[Butuan, ♂, May. Bill black; mandible green-yellow; feet dull brownish green.]

A single example, in which, however, the middle pairs of rectrices exhibit two pairs of spots near their insertion, showing that they do sometimes appear, and that Sonnerat was correct in so figuring the bird.

14. Merops bicolor (36).

[Butuan, ♀, May; Placer, ♂, July.]

Chestnut of upper parts unmixed with green. This Bee-eater can no longer be included among the birds peculiar to the Philippines, if the statement made by MM. Oustalet and David (Ois. de la Chine, p. 73) that it visits China during summer in small parties is correct. Up to now it has only been observed in the Philippines by naturalists during the months of February, March, April, July, and October.

15. Eurystomus orientalis (37).

[Butuan, ♂ ♀, May.]

16. Pelargopsis gigantea?

Pelargopsis gigantea, Walden, Ann. & Mag. N. H. ser. 4, vol. xiii. p. 123; *anteà*, p. 541. no. 10.

[Butuan, ♂, May. Iris dark brown; bill bright red; feet dark red.]

This single example, sent by Mr. Everett, is not in full attire. Brown predominates on the head, each feather being narrowly margined with creamy white. The under surface is buffy white, most intense on the abdomen and under tail-coverts, while the under wing-coverts and the axillaries and flanks are rich ruddy buff. Culmen 3·12, wing 5·88.

17. Ceyx argentata.

Ceyx argentata, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 533, "Dinagat" (December 1, 1877).

[Placer, ♂, July.]

Mr. Everett obtained two examples, both marked ♂, which differ in some respects from the type, which is a female. The dorsal plumage, as well as the upper tail-coverts, are snow-white, unmixed with blue or bluish green. The black of the flanks and breast is

washed with dark green and not with blue. The dimensions are also less. Wing 2·25.

18. Entomobia gularis (44).

[Surigao, ♂ ♀, May; Placer, ♂, July.]

19. Sauropatis chloris (47).

[Mouth of Butuan river, ♂, May. *b*. Surigao, ♀.]

20. Xantholæma hæmacephala (50).

[Surigao, ♀, May; Placer, ♀ (young), July.]

21. Macropteryx comatus (52).

[Placer, ♂, ♀, July.]
Wing 5·12.

22. Collocalia troglodytes (53).

[Placer, ♀, July. Iris and legs dark brown; bill black.]
The sexes do not differ.

23. Surniculus velutinus.

Surniculus velutinus, Sharpe[1], Tr. L. S. ser. 2, Zool. i. p. 320.

[Butuan, ♀, May. Iris dark chocolate-brown, bill and claws black; feet blue-grey.]

24. Eudynamis mindanensis (61).

[Butuan, ♂, May. Iris bright crimson; bill greenish grey; feet darker greenish grey.]

These and Malanipa individuals (*anteà*, p. 543) have been compared and are identical, and the dimensions are about equal. The type, however, in all probability came from south-west Mindanao.

25. Centrococcyx viridis (64).

[Surigao, ♂, May. Iris red.]

26. Pyrrhocentor melanops (65).

[Butuan, ♂, May. Iris crimson; bill black; legs leaden. *b*. Surigao, ♂. *c*. ♀, May. Iris crimson.]

The sexes, as represented in Mr. Everett's series, wear the same plumage, and are of equal dimensions.

27. Buceros mindanensis.

Buceros mindanensis, Tweeddale, *anteà*, p. 543.

[Butuan, ♂, May. Iris bright yellow; orbital skin blackish, with a yellow streak under the eye; feet dull coral-red; claws blackish grey. *b*. Surigao, ♂, May. Iris (in the living bird) pale green; orbital skin sooty black, but yellow just below the eye; skin of chin yellow; feet light coral-red; claws dark brown grey. *c*. Surigao, ♀, May. Iris white; feet light coral-red; nails black.]

[1] Mr. Sharpe has obliged me by comparing this Butuan example with the type.

All the five examples in a series of that number slightly differ from the type specimens in having the wing-coverts and back tinged with olive, and in the absence of a channelled or grooved plate, or even a distinct smooth plate, on the basal walls of the mandible. In this respect the North-Mindanao species agrees with that of Luzon, *B. hydrocorax*. One Butuan individual does exhibit a rudimentary plate; and it may be that these plates only mature with age. The rectrices, when first reproduced, are almost white.

28. CRANIORRHINUS LEUCOCEPHALUS (67)

[Surigao, ♂ ♀, May. Iris crimson; feet dark brown. *b.* Butuan, ♀. Iris crimson; orbital skin, base of the mandible, and bare skin of the chin fiery orange-red; bill deep red, lateral grooves brown, intermediate plates or spaces whitish, posterior plate dull reddish; feet dull black.]

The examples with black body, neck, and head-plumage (5) are all marked ♀ by Mr. Everett, and those with tawny throats and dark chestnut napes (2) are marked ♂. This confirms what has been previously stated. The females are slightly smaller, the bill considerably shorter than in the males, and the form of the casque is of a different type. It is not inflated, and is smooth, without any folds. The casque of the female is well delineated by Mr. Smit (Tr. Z. S. ix. t. 27), and that of the male by Huet (Pl. Col. 69). The example (♂) figured (*l. c.*) is a young male.

29. PENELOPIDES AFFINIS.

Penelopides affinis, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 534 (December 1, 1877).

♂. Like *P. panini*, but differs in wanting the perpendicular grooves on the thick lateral plates of the maxilla, which are smooth, in the grooves at the base of the mandible not being recurved, but straight, in the whole bill being much less massive, in the abdominal region and under tail-coverts being of the same colour as the breast, and not rufous, and in the rectrices having a black band at their insertion.

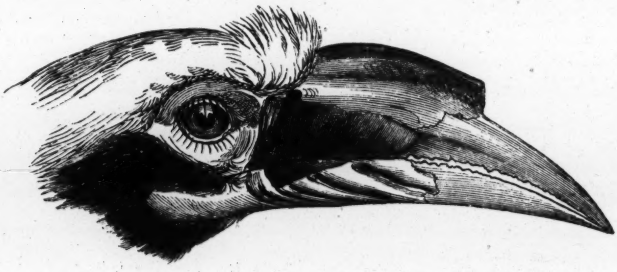
♀. Bill as in the male, and to that extent differs from that of *P. panini* ♀. The female also differs in having a black band at the base of the rectrices.

	Wing. in.	Tail. in.	Tarsus. in.	True culmen. in.
♂	9·25	9·00	1·75	3·40
♀	8·75	8·37	1·60	3·25

[Butuan, ♂, May. Iris crimson; orbital skin, nude portion of chin, and unfeathered part of the rami white; casque, smooth lateral plates of maxilla, and the ungrooved triangular space at base of mandible dark brown; the whole apical part of maxilla from the smooth lateral plates, and of mandible from the grooved base, pale brown; grooves on mandible dark brown; intermediate smooth spaces

light ochreous; feet greenish lead-colour; nails greyish black. *a*. Butuan, ♀, May. Iris crimson; orbital skin, nude part of chin, and unfeathered part of the rami dark blue; bill brown; feet dark greenish leaden. *b*, *c*. Surigao, ♂ ♀, May.]

Fig. 1.



Head of *Penelopides affinis*.

A representative form of *P. panini*, ex Panay, Negros, and Guimaras, but readily to be distinguished from that species and *P. manillæ*, ex Luzon, by the channelling on the lateral basal walls of the

Fig. 2.



Head of *Penelopides panini*.

bill. In one example some of the black upper tail-coverts are tipped and margined with dirty rusty. An old Surigao female has several of the secondary quills margined with ferruginous. A young Surigao male has a small part of the outer webs of the fourth, fifth, and

sixth primaries edged albescent. An old Surigao male has the thigh-coverts, ventral region, and under tail-coverts pale rufous, and most of the upper tail-coverts as in *P. panini*, otherwise as in typical *P. affinis*. In a Butuan and a Surigao male the middle pair of rectrices, with the exception of the basal black band, are rufous throughout, the normal black terminal band being only indicated by black blotches. The new rectrices are pale fulvous white instead of ferruginous when they first come in. The number of grooves on the mandible varies from three to four. The extreme altitude of the bill, ending at the nostril, is 1·06, whereas in *P. panini* it is 1·37.

30. Artamus leucorhynus (73).

[Mouth of Butuan river, ♀, May; *b*. Surigao, ♂, May.]

31. Graucalus striatus (74).

[*a*, Placer, ♂, July. Iris light Naples yellow. *b*, ♂, July. Iris dirty brownish white.]

The north Mindanao individuals have the wing somewhat shorter than typical examples. The example *b* is in first plumage, with the whole under surface barred with black. The others (*a*) have only the under surface, commencing with the lower breast, banded with black.

32. Lalage dominica (76).

[Butuan, ♂, May. *b*. ♂, June.]

33. Dicrurus striatus.

Dicrurus striatus, Tweeddale, *antea*, p. 545. no. 20.

[Butuan, ♂ ♀, May. Iris crimson; bill steel-black. *b*. Surigao, ♂, May. *c*. May, ♀ juv. Iris brown.]

Sexes alike. The young female (*c*) has the breast uniform black; no traces of metallic striation.

34. Leucocerca nigritorquis (83).

[Surigao, ♀, June.]

35. Cyornis philippinensis.

Cyornis philippinensis, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 325.

[Butuan, ♂ ♀, May.]

The North-Mindanao examples agree best with those from Luzon (Monte Alban). In dimensions they are equal.

36. Hypothymis azurea (85).

[Butuan, ♀, May; Placer, ♂, ♀, July.]

37. Broderipus acrorhynchus (90).

Oriolus chinensis, Linn., apud Sharpe, Cat. B. Mus. iii. p. 203, nec Lin.

[Butuan, ♂ ♀, May; *b*. Surigao, ♂ ♀, June.]

38. MACRONUS STRIATICEPS.

Macronus striaticeps, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 331.

[Surigao, ♂, June. Iris white; bill blackish; legs purple-grey.]

39. IXUS GOIAVIER (99).

[Surigao, ♂ ♀, May. Iris rich dark brown; bill, legs, feet, and nails black; Placer, ♂, July.]

40. POLIOLOPHUS UROSTICTUS (101).

Poliolophus urostictus (Salvadori), Sharpe, *t. c.* p. 334.

[Surigao, ♂, May. Orbital ring lemon-yellow. *a.* ♀, May. Iris dark brown; orbital ring yellow; bill black; legs dark grey.]

By the words "orbital ring" Mr. Everett probably means the nude eye-wattle and skin surrounding the eye. Sexes alike.

41. HYPSIPETES PHILIPPINENSIS (102).

[Butuan, ♂ ♀, May.]

Not separable from Luzon, Zebu, and Guimaras examples. It is not, as might have been expected, *H. rufigularis*—a representative species which occurs at Pasananca (South-west Mindanao).

42. CRINIGER EVERETTI. (Plate LXXXIV.)

Criniger everetti, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 535 (December 1, 1877).

♂ ♀. Above almost golden-yellow brown. Feathers of forehead, vertex, and occiput sublanceolate, brown, margined with golden yellow. Lores yellow. Feathers at base of mandible and cheeks yellow-tipped. Throat, neck, and upper breast brownish ochreous-yellow. Chin, lower breast, abdomen, ventral region, axillaries, under tail- and wing-coverts sulphur-yellow. Inner webs of primaries brown. Exposed surface of all the quills and the wing-coverts like back. Inner margin of inner webs of quills pale yellow. Upper surface of rectrices like that of quills. Under surface pale brown, washed with yellow; inner webs margined with pure yellow. Shafts of quills and rectrices ruddy brown above; of quills underneath yellow at base and brown towards the end; of rectrices bright yellow throughout.

	Wing. in.	Tail. in.	Tarsus. in.	Culmen. in.
♂	4·50	4·62	0·87	1·25
♀	4·35	4·25	0·87	1·12

[Surigao, ♂, May. Iris dark burnt sienna-brown; bill black, mandible greyish; legs grey; claws dark grey. *b.* ♀, May. Iris dark sienna-brown.]

Mr. Everett has sent a series of thirteen specimens of this distinct species of *Criniger*. It is readily to be distinguished by its ochreous-brown throat and upper breast. The nuchal hairs are present. The dimensions of the adult females appear to be less than those of the

males; otherwise the sexes are alike. This species belongs to a genus new to the Philippine area.

43. Copsychus mindanensis (106).

[Butuan, ♂ juv., May.]

Only differs from the adult male by having the breast dark grey, each feather with a fulvous central mark.

44. Cisticola grayi.

Cisticola grayi, Ann. & Mag. N. H. ser. 4. vol. ix. p. 40, "North Celebes."

[Surigao, ♂, May. Iris yellow-brown.]

This skin is not to be distinguished from the type of *C. grayi*, and may prove to be = *C. semirufa*, Cab., the description of which is, however, too meagre for recognition.

45. Orthotomus frontalis.

Orthotomus frontalis, Sharpe[1], Tr. L. S. ser. 2, Zool. i. p. 336; Ibis, 1877, p. 112, t. 2. fig. 1.

[Surigao, ♂, May. *b*. Butuan, ♀, May. Iris clay-brown; bill dark brown, mandible white; legs light transparent brown.]

46. Orthotomus nigriceps, sp. n. (Plate LXXXV.)

[Butuan, ♂, May. Iris clay-brown; maxilla black; mandible white; legs and feet pale brownish.]

Forehead, vertex, occiput, nape, and ear-coverts very dark brown or black. Space before the eye and a broad supercilium which passes behind the eye white; chin, cheeks, throat, and breast pale greyish white, the bases of the feathers being dark iron-grey. Lower breast tinged with yellow. Flanks, abdomen, under wing- and tail-coverts yellow-olive. Back, uropygium, and upper tail-coverts pure olive-green. All the wing-feathers brown, the quills being externally margined with yellowish olive-green, the minor and major coverts with a paler yellow-olive. Thigh-coverts mixed pale rufous and olive-green. Rectrices above dull rufous, with very narrow pale margins. Underneath pale rufous, washed with light yellowish green.

Wing.	Tail.	Tarsus.	Culmen.
1·70	1·70	0·85	0·60

Allied to *O. cinereiceps*, but with a black head.

47. Corydalla lugubris (117).

[Surigao, ♂ ♀, May, June; Placer, ♂, July.]

After a careful comparison made between this Philippine race, *C. rufula* of India, and *C. malayensis* from Malacca and Sumatra, it appears to be an exactly intermediate form, *C. rufula* being the palest and of an ochreous red, *C. lugubris* being darker and greyer and *C. malayensis* being more reddish brown. Every individual of my large series of this species is constant in its colouring.

[1] Compared by Mr. Sharpe.

48. Zosterops everetti.

Zosterops everetti, Tweeddale, *anteà*, p. 762.

[Surigao, ♂, June. Iris yellow-brown; bill black; legs grey.]

A single example, which only differs from the type (♂ ex Zebu) by having the yellow on the mesial line much more developed.

49. Dicæum rubriventer (120 partim).

Dicæum rubriventer, Lesson, Tr. p. 303; Tweeddale, *anteà*, p. 763.

[Butuan, ♂ ♀, May. *b*. Surigao, ♂. May; Placer, ♂, July.]

The example marked ♀ only differs from a considerable series of males in having the upper plumage ashy grey, and not glossy black. Underneath it is undistinguishable from the male.

50. Dicæum cinereigulare, sp. n.

[*a*. Butuan, ♂, May. Iris dark brown; bill black. *b*. Surigao, ♀, June. Iris chocolate. *c*. Placer, ♂, July. Iris brown; bill black; legs dark grey.]

Closely allied to *D. dorsale*, Sharpe, but differs in having the breast intense orange-red and the upper breast and sides of throat grey slightly tinged with pale yellow. The chin and middle of throat are pale yellow. These characters are present in all the specimens (eight) sent by Mr. Everett from north Mindanao.

51. Æthopyga (Eudrepanis) bella.

Æthopyga bella, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 537 (December 1, 1877).

♂. Chin, throat, breast, and uropygium bright sulphur-yellow. Forehead, vertex, minor carpal coverts, upper tail-coverts, and upper surface of rectrices dark metallic green. Occiput, nape, and wing-coverts dark olive. Cheeks, lores, behind the eye, sides of head and neck, interscapulars, and back deep blood-red. Quills almost black, margined with dark olive. Abdomen, flanks, vent, under tail-coverts, and under wing-coverts silky white, more or less tinged with pale yellow, especially on the mesial line, under tail-coverts, and carpal edge. A few blood-red feathers on the upper breast. A metallic violet spot on sides of head. A narrow line of deep blood-red runs along the rami of the mandible. A bold metallic moustache springs from the base of the mandible, and descends the sides of the neck; the upper half violet, the lower half green.

♀. Above, wing-coverts, and edgings to quills olive-green. Uropygium bright sulphur-yellow as in ♂. Space before the eye, cheeks, ear-coverts, chin, throat, and upper breast grey tinged with yellowish olive-green. Lower breast, abdomen, flanks, and under tail-coverts white tinged with yellow. Under wing-coverts white, faintly tinged with yellow. Quills and rectrices dark brown, margined with olive; lateral rectrices tipped with albescent olive.

	Wing. in.	Tail. in.	Tarsus. in.	Culmen. in.
♂.	1·68	1·44	0·50	0·50
♀.	1·62	1·12	0·50	0·50

[Surigao, ♂, May. Iris dark umber. *b.* ♂ juv.]

Five examples of this lovely small Sun-bird were obtained by Mr. Everett, the discoverer of the species. Four are in the full adult dress, and are marked ♂; and one is in the dull olive-grey dress of either the young male or adult female, but is marked ♂ juv. No example marked ♀ is sent.

52. NECTAROPHILA SPERATA (122).

Cinnyris sperutus (Lin.), Shelley, *Cinnyridæ*, pt. iv. t.

[Butuan, ♂, May. Iris brown; bill jet-black; legs blackish brown. *b.* Surigao, ♂, May; Placer, ♂, July.]

Mr. Everett has sent a large series (fifteen examples) from North Mindanao and Dinagat Island of this species in full male plumage. They in no respect differ from Luzon, Guimaras, and Negros individuals, excepting that the average length of their bill is less. Along with this series of males is a smaller series (five) of individuals all marked ♀ by Mr. Everett, and which I am at a loss to determine. Were it not that Captain Shelley has figured and described (*l. c.*) the female from a specimen obtained by Dr. Steere in Negros (?) as having the "sides and upper half of the head and neck ashy grey; the wings dark brown, edged yellowish olive; underparts sulphur-yellow," I should without hesitation refer the examples marked ♀ by Mr. Everett to *N. sperata* ♀. In a Surigao example (marked ♀) the quills are brown, conspicuously margined with rusty ochre, so that the wing when closed appears to be ferruginous or ruddy yellowish brown. The forehead, vertex, and nape are dull brownish grey. The chin and all the throat and sides of head light grey, tinged with yellow. Breast, abdomen, flanks grey, washed with a brighter yellow[1]. Outer pair of rectrices with a pale albescent apical mark. This individual must either be *N. sperata* ♀ vel ♂ juv., or belong to some undescribed species. Dimensions as in *N. sperata* ♂.

53. ARACHNECHTHRA JUGULARIS (123).

[Butuan, ♂ ♀, May; Surigao, ♂ ♀, May and June; Placer, ♀, July.]

54. ANTHOTHREPTUS GRISEIGULARIS, n. sp.

[Surigao, ♂ ♀, May. Iris bright Indian-red; bill black; legs greenish grey; Placer, ♀, July. Iris and bill dark brown; lower half of bill very light brown; legs greenish; nails brown; soles ochre.]

♂. Forehead, crown, occiput, nape, back metallic green. Uropygium and upper tail-coverts metallic purplish blue. A few of the carpal coverts and tips of the median wing-coverts metallic violet-blue. Median wing-coverts maroon. Minor wing-coverts metallic green. Space before the eyes, cheeks, ear-coverts, major wing-

[1] Unfortunately Captain Shelley does not state with precision the habitats of the specimens he has described and figured. But on referring to Mr. Sharpe's account it will be found that the only supposed female of this species was obtained by Dr. Steere in Negros.

coverts, and scapulars maroon. Chin and throat grey. A streak commencing at base of mandible and running down each side of the neck metallic green, with a tinge of violet in certain lights. Breast, flanks, abdomen, and under tail-covevts greenish yellow. Axillary tufts pure bright yellow. Under wing-coverts pale yellow-white. Rectrices black, tinged with metallic green, changing to violet-blue in certain lights. Primaries dark brown, with narrow albescent margins; secondaries dark brown, edged with maroon.

♀. Feathers of the top of head, cheeks, ear-coverts, the nape, upper back, and minor wing-coverts brown, each conspicuously margined with grey, the margins of the interscapulars and nuchal feathers being faintly tinged with green. Lower back, uropygium, and upper tail-coverts (some of the latter tinged with maroon) greyish green. Chin and throat greyish white. Upper breast grey. Lower abdomen, flanks, and under tail-coverts pale greenish yellow. Quills dark brown; primaries narrowly edged with albescent rufous, the secondaries broadly with dingy maroon. Major coverts and scapulars the same dingy maroon. Rectrices dark brown, margined with dingy maroon, and a minute albescent terminal fringe. Wing-lining as in male.

	Wing.	Tail.	Tarsus.	Culmen.
♂.	2·62	1·75	0·68	0·62
♀.	2·25	1·50	0·68	0·62

Both Mr. Sharpe and Captain Shelley are of opinion that this species differs specifically from *A. chlorogaster*, Sharpe. From *A. malaccensis* the male is chiefly distinguished by having the head and back pure green, contrasting strongly with the purple-blue of the uropygium and upper-tail-coverts, and by its pure grey and not pale rufous throat. The dress of the adult female in *A. malaccensis* is not as yet accurately known; but, presuming that in that species the adult female has a grey throat, these Surigao females only differ in having the crown of the head greyer and less green.

55. Corvus philippinus (125).

[Suriago, ♂ ♀, May.]

The dimensions of the females are less than those of the male, and the bill is weaker.

	Wing.	Tail.	Tarsus.	Culmen.	Extreme altitude.
♂.	12·25	9·50	2·12	2·25	1·00
♀.	11·37	8·50	1·87	2·07	0·87

This discrepancy of size is to be found in Zebu examples also.

56. Calornis panayensis (128).

[Surigao, ♂ ♀, May; Placer, ♂, July.]

Sexes alike.

57. Sarcops calvus (129).

[Butuan, ♀, May. *b*. Surigao, ♂ ♀, May.]

Sexes alike.

58. Munia jagori (132).

[Butuan, ♂, May; Placer, ♂ ♀, July.]

59. Osmotreron axillaris (136).

[Mouth of Butuan river, ♀, May. Iris light silvery green; cere dull dark red; bill greenish lead. *b*. Surigao, ♂, May.]

60. Xenotreron incognita.

Ptilopus? incognita, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 538 (December 1, 1877).

♀. Above, tertiaries, and wing-coverts light emerald-green. Forehead, lores, ophthalmic region, cheeks, and ear-coverts grey mixed with dingy green. Chin and throat almost pure white. Neck and sides of neck greenish grey. An ill-defined pectoral band formed of green feathers tipped with ruddy orange; breast ashy green tinged with the same colour. Flanks green. Abdomen mixed green and ashy. Under tail-coverts (which are lengthened) pale creamy white with a brown central streak. Thigh- and tarsal coverts ashy brown. Exposed upper surface of rectrices tinged with golden. Lower surface pale ashy brown, with ill-defined paler tips. Quills dark brown, margined outwardly with dark green. Secondaries with a pale narrow creamy border, still narrower on the major coverts.

Wing 5·25 inches, culmen 0·75, tarsus 0·81, tail 3·75.

[Butuan, ♀, May. Iris dark hazel; bill dull greenish orange; feet pale reddish.]

The only example obtained by Mr. Everett is that of an immature female.

61. Ramphiculus occipitalis (138).

[Butuan, ♂, May. Colour of iris &c. as in Cebu birds.]

Not separable from Luzon and Zebu examples.

62. Phabotreron amethystina (139).

[Butuan, ♂, May. Iris warm orange-brown; bill black; feet carmine; nails grey.]

Does not differ from Luzon examples.

63. Phabotreron brevirostris.

Phabotreron brevirostris, Tweeddale, *anteà*, p. 549.

[Butuan, ♂ ♀, May. *b*. Surigao, ♂, May; Placer, ♂, July ♂.]

The examples marked ♂ and ♀ do not materially differ; but in the male the amethystine colouring of the back and rectrices is more pronounced. The rufo-fulvous forehead, the albescent chin and throat, the amethystine-coloured cap and rectrices, and the short bill distinguish this representative form from *P. leucotis*.

64. Carpophaga ænea (141).

[Surigao, ♂, May. *b*. Butuan, ♂, May.]

65. Turtur dussumieri (147).

[Butuan, ♀, May. Iris reddish; bill grey-black; feet dull carmine. *b.* Surigao, ♂, May; Placer, ♂, July.]

The dimensions of the female are a trifle less than those of the male. In colour and marking there appears to be but little difference, the nuchal collar being perhaps more developed in the male.

66. Phlogœnas crinigera.

Pampusanna criniger, Pucheran, Voy. Pôle Sud, iii. p. 118 (1853), Atlas, t. 27. f. 2; Sclater, P. Z. S. 1865, p. 238.

Phlogœnas bartletti, Sclater, P. Z. S. 1863, p. 377. t. xxxiv.

[Placer, ♂, July. Iris brown; bill black; legs dull carmine.]

The type is stated by Pucheran to have been found in the Sooloo Islands (Soog.). Mr. Sclater, on seeing it at Paris, recognized its identity with his *P. bartletti*, founded on four living individuals sent to Liverpool and stated to have been brought from an uninhabited island near the Philippines. A full account of these birds, together with delineations of the sternum, is given by Mr. Sclater (*l. c.*). The Sooloo habitat requires confirmation. The bird is a representative form of *P. cruenta*, but perfectly distinct. The dark claret-coloured patch on the breast replaces the blood-red pectoral plumes of the older known species; and the feathers of which it is composed are even of a harsher and stiffer texture.

67. Chalcophaps indicus (150).

[Surigao, ♂, June.]

68. Charadrius fulvus (159).

[Butuan, ♀, May.]

A number of black feathers on the under surface.

69. Squatarola helvetica (160).

[Placer, ♀, July. Iris chocolate; legs light grey.]

In winter plumage, although shot in July.

70. Ægialitis dubia (162).

[Placer, ♀, July. Orbital ring orange.]

71. Ægialites cantianus.

Charadrius cantianus, Lath. Suppl. Ind. Orn. p. lxvi. (1801).

[Placer, ♂, July. Iris deep brown; bill glossy black; legs light grey.]

Not hitherto recorded from the Philippines.

72. Erythra phœnicura (170).

[Butuan, ♂ ♀, May.]

73. Hypotænidia torquata (177).

[Butuan, ♀, May. Iris crimson.]

One example; pectoral band fully developed.

74. Hypotænidia striata (179).

[Butuan, ♂ ♀, May.]
The female has all the throat white, and all its hues, the rufous of the head and nape included, much paler than in the male.

75. Limnocinclus acuminatus.[1]

Totanus acuminatus, Horsf. Tr. L. S. xiii. p. 192, "Java."
Schœniculus australis (Jard. & Selby), Gould, B. Austr. vi. t. 30.
[Butuan, ♂, May. Bill dark brown; legs greenish grey.]
A single example in almost full summer dress.

76. Totanus hypoleucos (183).

[Butuan, ♀, May.]
Three examples, all marked ♀.

77. Rhynchæa capensis (189).

[Butuan, ♂, May.]

78. Ardetta flavicollis (191).

[Butuan, ♂, May. Iris bright yellow; bill purplish brown; legs darker purplish brown. *b*. ♀, May. Iris red-brown; bill light warm brown; legs and feet greyer brown.]
Examples from China, Ceylon, and all India do not differ.

79. Butorides javanica (197).

[Mouth of Butuan river, ♂, May. Iris bright yellow; legs and feet dull dark chrome; bill black; bare orbital skin green-yellow. *b*. Butuan, ♀, May.]
Dorsal train fully developed.

80. Nycticorax griseus (199).

[Butuan, ♂, May. Iris orange; bill black, base and mandible light green; legs and feet light green.]
Immature.

81. Dendrocygna vagans (203).

An example is in the collection, but without a label; it is either from North Mindanao or else from Dinagat.

[1] In this identification I am confirmed by Mr. Harting.

APPENDIX.

LIST OF ADDITIONS TO THE SOCIETY'S MENAGERIE

DURING THE YEAR

1877.

Jan. 4. 1 Common Crossbill (*Loxia curvirostra*). Purchased.
2 Common Swans (*Cygnus olor*). Purchased.
5. 1 American Black Bear (*Ursus americanus*). Presented by Mr. W. Stead.
7. 1 Common Partridge (*Perdix cinerea*). Presented by Mr. H. Laver.
1 Razorbill (*Alca torda*). Presented by Mr. W. Thompson.
9. 2 Secretary Vultures (*Serpentarius reptilivorus*). Presented by Capt. Larmer, S.S. 'African.'
1 Himalayan Bear (*Ursus tibetanus*). Presented by H.R.H. the Prince of Wales.
10. 2 Crowned Partridges (*Rollulus cristatus*), ♂ and ♀. Presented by Mr. Barclay Field, F.L.S.
11. 2 Carolina Conures (*Conurus carolinensis*). Presented by Mr. L. Delves Broughton.
13. 1 Wood-Owl (*Syrnium aluco*). Presented by Mrs. A. O. Faulkner.
3 Chukar Partridges (*Caccabis chukar*). Presented by Capt. Newton Pauli.
15. 1 Bay Lynx (*Felis rufa*). Presented by Mr. Otho N. Shaw. From the Rocky Mountains.
16. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mrs. Cecil Long.
1 Ocelot (*Felis pardalis*), ♀. Purchased.
1 Azara's Fox (*Canis azaræ*). Received.
1 Herring-Gull (*Larus argentatus*). Presented by Mr. A. Kinnear.
17. 1 Malbrouck Monkey (*Cercopithecus cynosurus*), ♀. Presented by Mr. L. C. Brown.
1 Pigtailed Monkey (*Macacus nemestrinus*), ♀. Presented by the Crew of H.M.S. 'Dwarf.'
2 Teguexin Lizards (*Teius teguexin*). Presented by Mr. A. Stradling, M.R.C.S.
1 Tataupa Tinamou (*Crypturus tataupa*). Purchased. From Bahia.
2 Talpacoti Ground-Doves (*Chamæpelia talpacoti*). Purchased. From Bahia.
2 Scaly Doves (*Scardafella squamosa*). Purchased. From Bahia.
1 Chopi Starling (*Aphobus chopi*). Purchased. From Pernambuco.

Jan. 17. 1 Chilian Sea-Eagle (*Geranoaëtus melanoleucus*). Purchased. From Paraguay.
18. 1 Black-eared Marmoset (*Hapale penicillata*). Deposited.
2 Ring-tailed Lemurs (*Lemur catta*), ♂ and ♀. Purchased.
23. 3 Silky Marmosets (*Midas rosalia*), 1 ♂ and 2 ♀. Purchased.
25. 2 Vervet Monkeys (*Cercopithecus lalandii*), ♂ and ♀. Presented by Mr. T. G. Butler.
1 Ring-necked Parrakeet (*Palæornis torquata*). Presented by Miss Smith.
26. 2 Arctic Foxes (*Canis lagopus*). Presented by Sir Thomas Erskine, Bart., F.Z.S.
30. 1 Ocelot (*Felis pardalis*). Purchased.
1 Brazilian Tree-Porcupine (*Cercolabes prehensilis*). Presented by Mr. Eliot G. Currey. From Trinidad.

Feb. 1. 3 Rhomb-marked Snakes (*Psammophylax rhombeatus*). Presented by the Rev. G. H. R. Fisk, C.M.Z.S. From the Cape.
1 Hoary Snake (*Coronella cana*). Presented by the Rev. G. H. R. Fisk, C.M.Z.S. From the Cape.
2. 3 Amherst Pheasants (*Thaumalea amherstiæ*), 1 ♂ and 2 ♀. Presented by Dr. A. G. Reid, Hankow, China.
2 Andean Geese (*Bernicla melanoptera*), ♂ and ♀. Purchased.
3. 1 Pig-tailed Monkey (*Macacus nemestrinus*), ♀. Presented by Dr. Broadbent.
1 Yellow-fronted Amazon (*Chrysotis ochrocephala*). Presented by Mr. F. A. B. Geneste.
2 Double-striped Thicknees (*Œdienemus bistriatus*). Presented by Capt. H. King, R.M.S.S. 'Dee.'
5. 2 Chinese Geese (*Anser cygnoides*), ♂. Presented by Mr. R. H. Medhurst.
6. 1 Macaque Monkey (*Macacus cynomolgus*). Presented by Master R. Wallace.
7. 1 Common Paradoxure (*Paradoxurus typus*). Deposited.
1 Common Raven (*Corvus corax*). Presented by Mrs. Nathan.
8. 1 Rough-legged Buzzard (*Archibuteo lagopus*). Presented by Mr. W. R. Paxton.
9. 1 Red-vented Cockatoo (*Cacatua philippinarum*). Purchased.
2 Maned Geese (*Bernicla jubata*), ♂ and ♀. Purchased.
10. 1 Common Magpie (*Pica caudata*). Presented by Miss Jessie Bovill.
1 Common Marmoset (*Hapale jacchus*), ♀. Deposited.
12. 1 Pike (*Esox lucius*). Presented by Mr. A. T. Ranson.
14. 1 Barbary Ape (*Macacus inuus*), ♂. Deposited.
1 Hairy-rumped Agouti (*Dasyprocta prymnolopha*). Born in the Menagerie.
15. 2 Feline Dourocoulis (*Nyctipithecus felinus*), ♂ and ♀. Purchased.
2 Cariamas (*Cariama cristata*). Purchased.
1 Downy Owl (*Pulsatrix torquata*). Purchased.
1 Mexican Eared Owl (*Asio mexicanus*). Purchased. See P. Z. S. 1877, p. 159.
2 Globose Curassows (*Crax globicera*), ♂ and ♀. Purchased.
1 Crested Curassow (*Crax alector*). Purchased.
1 Great-billed Rhea (*Rhea macrorhyncha*). Purchased. See P. Z. S. 1877, p. 160.
1 Anaconda (*Eunectes murinus*). Purchased.

Feb. 16. 2 Pennant's Parrakeets (*Platycercus pennanti*). Presented by Mr. E. Sargent.
17. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mr. Edward Purchase.
20. 1 Maugé's Dasyure (*Dasyurus maugæi*), ♀. Presented by Mr. Robert S. Craig.
1 Slender-billed Cockatoo (*Licmetis tenuirostris*). Presented by Mr. Bartle G. Goldsmid.
1 Common Kestrel (*Tinnunculus alaudarius*). Presented by Mr. W. W. Hughes, F.Z.S.
21. 1 Burrhel Wild Sheep (*Ovis burrhel*), ♂. Deposited.
1 Chilian Sea-Eagle (*Geranoaëtus melanoleucus*). Presented by Mr. C. Clifton, F.Z.S.
1 Rough-legged Buzzard (*Archibuteo lagopus*). Presented by Lady Bunbury.
1 Common Rattlesnake (*Crotalus durissus*). Purchased.
22. 1 Levaillant's Amazon (*Chrysotis levaillanti*). Presented by Mrs. Matthews.
1 Passerine Owl (*Glaucidium passerinum*). Presented by Mr. T. W. Evans, M.P.
23. 1 Suricate (*Suricata zenik*). Deposited.
25. 2 Beautiful Parrakeets (*Psephotus pulcherrimus*), ♂ and ♀. Deposited.
27. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mr. Thomas Daly.
1 Galapagan Tortoise (*Testudo elephantopus*). Presented by Lieut. W. H. Henderson, R.N., H.M.S. 'Peterel.'
1 Common Nuthatch (*Sitta cæsia*). Purchased.
28. 1 Red Kangaroo (*Macropus rufus*), ♀. Born in the Gardens.

Mar. 3. 2 Herring-Gulls (*Larus argentatus*). Deposited.
5. 2 Hooded Crows (*Corvus cornix*). Presented by Mr. F. Cresswell.
1 Rose Hill-Parrakeet (*Platycercus eximius*). Presented by Mr. J. J. Chapman.
6. 1 Rufous-vented Guan (*Penelope cristata*). Presented by Mr. Daniel Miron.
8. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mrs. Payton.
1 Hodgson's Barbet (*Megalæma hodgsoni*). Purchased. See P. Z. S. 1877, p. 303.
2 Striated Jay-Thrushes (*Grammatoptila striata*). Purchased. See P. Z. S. 1877, p. 303.
1 Red-headed Laughing-Thrush (*Trochalopteron erythrocephalum*). Purchased.
3 Black-headed Sibias (*Sibia capistrata*). Purchased. See P. Z. S. 1877, p. 303.
3 Brown-eared Bulbuls (*Hemixos flavala*). Purchased. See P. Z. S. 1877, p. 303.
2 Rufous-bellied Bulbuls (*Hypsipetes macclellandi*). Purchased.
1 Two-Wattled Cassowary (*Casuarius bicarunculatus*). Purchased.
1 Hooded Crane (*Grus monachus*). Purchased.
1 Macaque Monkey (*Macacus cynomolgus*), rufous variety. Deposited.
13. 2 Orang-outangs (*Simia satyrus*), 2 ♂. Presented by Dr. R. Sim, F.Z.S. See P. Z. S. 1877, p. 303.

Mar. 13. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Presented by Mr. J. Mason Allen.
1 Cape Hyrax (*Hyrax capensis*). Purchased.
1 Chinese Blue Magpie (*Urocissa cinensis*). Purchased.
1 Red-capped Parrot (*Pionopsitta pileata*). Purchased.
3 Red-eared Conures (*Conurus cruentatus*). Purchased.
1 Grey Amphisbæna (*Blanus cinereus*). Presented by Mr. John Goddard. See P. Z. S. 1877, p. 270.

14. 1 Grivet Monkey (*Cercopithecus griseoviridis*), ♀. Presented by Mr. J. Walter Richardson.
1 Common Badger (*Meles taxus*). Born in the Menagerie.

15. 1 Blossom-headed Parrakeet (*Palæornis cyanocephala*). Received in exchange.
1 Arabian Baboon (*Cynocephalus hamadryas*), ♀. Purchased.

16. 1 Sarus Crane (*Grus antigone*). Purchased.

17. 1 American Jabiru (*Mycteria americana*). Purchased.

19. 1 Puma (*Felis concolor*), ♂. Presented by Commander Stanhope Grove, R.N.
1 Black-eared Marmoset (*Hapale penicillata*). Presented by Mr. C. Weedon.

20. 1 Burrhel Wild Sheep (*Ovis burrhel*), ♂. Deposited.
1 Grey-breasted Parrakeet (*Bolborhynchus monachus*). Received in exchange.
1 Nonpareil Finch (*Cyanospiza ciris*). Received in exchange.

21. 1 Nisnas Monkey (*Cercopithecus pyrrhonotus*), ♂. Presented by Mr. B. C. Simpson.
2 Upland Geese (*Bernicla magellanica*), ♂ and ♀. Purchased. From Patagonia.

22. 1 White-throated Capuchin (*Cebus hypoleucus*). Presented by Mr. George Nurse.

23. 2 Great Cyclodus Lizards (*Cyclodus gigas*). Purchased.
1 Stump-tailed Lizard (*Trachydosaurus rugosus*). Purchased.
1 Stokes's Lizard (*Silubosaurus stokesi*). Purchased.
2 Blue-bearded Jays (*Cyanocorax cyanopogon*). Purchased.
2 White-fronted Guans (*Penelope jacucaca*). Purchased.
2 Turkey Vultures (*Cathartes aura*). Purchased.
3 West-India Rails (*Aramides cayennensis*). Purchased.
2 Hairy Tree-Porcupines (*Sphingurus villosus*). Purchased.
1 Common Boa (*Boa constrictor*). Purchased.
1 Zebu (*Bos indicus*), ♂. Born in the Menagerie.

24. 2 Slender-billed Cockatoos (*Licmetis tenuirostris*). Presented by Mr. W. Dillon Massey.

26. 3 Fire-tailed Finches (*Erythrura prasina*). Purchased.

27. 1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Presented by Mr. Thos. Welsh.
1 Great Kangaroo (*Macropus giganteus*), ♀. Born in the Gardens.
1 Yellow-footed Rock-Kangaroo (*Petrogale xanthopus*), ♀. Born in the Gardens.

28. 1 Prussian Carp (*Carassius vulgaris*). Presented by Mr. J. Smith.
1 Bream (*Abramis brama*). Presented by Mr. J. Smith.
6 Tench (*Tinca vulgaris*). Presented by Mr. J. Smith.
6 Perch (*Perca fluviatilis*). Presented by Mr. J. Smith.
18 Roach (*Leuciscus rutilus*). Presented by Mr. J. Smith.
2 Rufous Tinamous (*Rhynchotus rufescens*). Presented by Mr. F. Searle Parker.

Mar. 29. 1 Naked-eared Deer (*Cervus gymnotis*), ♀. Presented by Mr. C. Cooper. From Guayaquil.
31. 1 Feline Dourocouli (*Nyctipithecus felinus*). Purchased. From Cartagena.
1 Kinkajou (*Cercoleptes caudivolvulus*). Purchased. From Cartagena.
3 Blue-shouldered Tanagers (*Tanagra cyanoptera*). Purchased. From Cartagena.
1 Adorned Terrapin (*Clemmys ornata*). Purchased. From Cartagena.
2 Common Otters (*Lutra vulgaris*). Presented by Mr. Augustus B. Foster.
1 Collared Fruit-Bat (*Cynonycteris collaris*). Born in the Gardens.
1 Black Swan (*Cygnus atratus*). Bred in the Gardens.

April 3. 2 Sykes's Hemipodes (*Turnix sykesi*). Presented by Mrs. Wood-Mason.
3 Chinese Quails (*Coturnix chinensis*), 2 ♂ and 1 ♀. Presented by Mrs. Wood-Mason.
1 Rain-Quail (*Coturnix coromandelica*), ♂. Presented by Mrs. Wood-Mason.
1 Asiatic Quail (*Perdicula asiatica*), ♂. Presented by Mrs. Wood-Mason.
4. 1 Ceylon Fish-Owl (*Ketupa ceylonensis*). Presented by Capt. B. B. Turner. See P. Z. S. 1877, p. 418.
5. 1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Presented by Mr. W. Bazeley.
1 Entellus Monkey (*Semnopithecus entellus*). Received in exchange.
6. 1 Common Wolf (*Canis lupus*), ♀. Presented by Mr. J. A. Parlet.
8. 1 Collared Fruit-Bat (*Cynonycteris collaris*). Born in the Menagerie.
9. 1 Smooth Snake (*Coronella lævis*). Received in exchange.
10. 2 Alpine Marmots (*Arctomys marmotta*). Received in exchange.
11. 1 Bennett's Wallaby (*Halmaturus bennetti*), ♂. Presented by Miss E. Woollatt.
1 Malabar Green Bulbul (*Phyllornis aurifrons*). Presented by Mrs. Arabin, F.Z.S.
2 Siamese Pheasants (*Euplocamus prælatus*), ♂ and ♀. Purchased.
1 Chinchilla (*Chinchilla lanigera*). Born in the Gardens.
12. 2 Smooth Newts (*Triton tæniatus*). Presented by Master Guy Lutley Sclater.
13. 1 Impeyan Pheasant (*Lophophorus impeyanus*), ♀. Purchased.
14. 1 Ring-necked Parrakeet (*Palæornis torquata*). Deposited.
1 White-fronted Guan (*Penelope jacucaca*). Purchased.
1 White-eyebrowed Guan (*Penelope superciliaris*). Purchased.
2 Scaly Doves (*Scardafella squamosa*). Purchased.
2 Superb Tanagers (*Calliste fastuosa*). Purchased.
1 Great American Egret (*Ardea egretta*). Purchased.
1 Tuberculated Lizard (*Iguana tuberculata*). Purchased.
15. 1 Green Monkey (*Cercopithecus callitrichus*). Deposited.
1 Brown Capuchin (*Cebus fatuellus*). Deposited.
16. 1 Brown Monkey (*Macacus brunneus*), ♂. Deposited.

April 16. 1 Bay Bamboo-Rat (*Rhizomys badius*). Presented by Mr. J. Wood-Mason.
1 Horned Lizard (*Phrynosoma cornutum*). Presented by Mr. T. Clover.
19. 2 Chinchillas (*Chinchilla lanigera*). Born in the Menagerie.
20. 1 Rusa Deer (*Cervus rusa*). Presented by Mr. A. A. Fraser, F.Z.S.
1 Demeraran Cock of the Rock (*Rupicola crocea*), ♂. Purchased.
23. 1 Crested Porcupine (*Hystrix cristata*). Presented by Capt. Smerdon, S.S. 'Orion.'
1 Indian Cobra (*Naia tripudians*). Presented by the Hon. W. Dumaresq Wright.
8 Vulturine Guinea-Fowls (*Numida vulturina*). Deposited.
24. 1 Beisa Antelope (*Oryx beisa*), ♂. Deposited.
1 Bohor Antelope (*Cervicapra bohor*), ♀. Deposited. See P. Z. S. 1877, p. 418.
2 African Sheep (*Ovis aries*), ♂ and ♀. Deposited.
1 King Parrakeet (*Aprosmictus scapulatus*), ♀. Presented by Miss Jones.
1 Black Scoter (*Œdemia nigra*). Presented by Capt. E. Dixon.
25. 1 Toque Monkey (*Macacus pileatus*), ♂. Deposited.
1 White Pelican (*Pelecanus onocrotalus*). Presented by Mr. A. C. Henderson.
26. 1 Indian Leopard (*Felis pardus*). Presented by Dr. Sidney Smith.
1 Common Nightingale (*Daulias luscinia*). Received in exchange.
1 Hawfinch (*Coccothraustes vulgaris*). Presented by Capt. Salvin.
27. 1 Pygmy Marmoset (*Hapale pygmæa*), ♂. Purchased. From Pebas, Upper Amazons. See P. Z. S. 1877, p. 418.
2 Yellow-thighed Parrots (*Caica xanthomera*). Purchased. From Yquitos, Upper Amazons. See P. Z. S. 1877, p. 419.
1 Rough Terrapin (*Clemys punctularia*). Purchased. From Para.
1 Egyptian Gazelle (*Gazella dorcas*), ♂. Presented by Her Majesty the Queen.
28. 1 Suricate (*Suricata zenik*). Presented by Mr. J. Forbes Nixon.
30. 4 Common Foxes (*Canis vulpes*). Born in the Menagerie.

May 1. 1 Rock-Cavy (*Cerodon rupestris*). Purchased.
1 Restless Cavy (*Cavia caprera*). Deposited.
2 Green-winged Doves (*Chalcophaps indica*). Presented by Mrs. M. A. Moore.
1 Hamilton's Terrapin (*Clemmys hamiltoni*). Presented by Mrs. M. A. Moore.
4 Chilian Pintails (*Dafila spinicauda*). Bred in the Gardens.
2. 7 Raccoon-like Dogs (*Nyctereutes procynides*). Born in the Menagerie. See P. Z. S. 1877, p. 530.
3 Water-Ouzels (*Cinclus aquaticus*). Presented by Mr. B. G. Davies Cooke.
3. 6 River-Lampreys (*Petromyzon fluviatilis*). Presented by Mr. A. H. Cocks, F.Z.S.
1 Indian Python (*Python molurus*). Presented by Mr. C. A. F. Powell.

May 4. 1 Virginian Deer (*Cervus virginianus*). Deposited.
7. 2 Maugé's Dasyures (*Dasyurus maugæi*). Presented by Capt. J. C. Harris.
1 Antarctic Skua (*Stercorarius antarcticus*). Presented by Capt. W. Vincent Legge, R.A. From Ceylon.
1 Indranee Owl (*Syrnium indranee*). Presented by Capt. W. Vincent Legge, R.A. From Ceylon.
1 Ceylon Hawk-Eagle (*Spizaëtus ceylonensis*). Presented by Capt. W. Vincent Legge, R.A. From Ceylon. See Ibis, 1877, p. 431.
1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mrs. Dore.
8. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Miss Ada Sharpe.
2 Senegal Touracous (*Corythaix persa*). Presented by Mr. J. G. Tayler.
9. 1 Hoolock Gibbon (*Hylobates hoolock*), ♂. Presented by Mr. John Scrymgeour.
2 Meadow-Pipits (*Anthus pratensis*). Presented by Mr. J. Young.
2 White-eared Conures (*Conurus leucotis*). Presented by Lady Greville.
10. 1 Saddle-billed Stork (*Xenorhynchus senegalensis*). Purchased.
5 Peba Armadillos (*Tatusia peba*). Purchased.
1 Black Sternothere (*Sternothærus niger*). Purchased.
1 Masked Paradoxure (*Paradoxurus larvatus*). Purchased.
11. 1 Senegal Touracou (*Corythaix persa*). Presented by Capt. R. H. Crewe.
13. 1 Wild Boar (*Sus scrofa*), ♂. Born in the Menagerie.
15. 2 Tigers (*Felis tigris*), 2 ♂. Presented by Rear-Admiral Rowley Lambert, C.B. From Johore, Malay peninsula.
2 Javan Chevrotains (*Tragulus javanicus*). Presented by Messrs. Hill and Isaac, Lieuts. R.N.
1 Saddled Squirrel (*Sciurus ephippium*). Presented by Messrs. Hill and Isaac, Lieuts. R.N. From Borneo.
1 Green Turtle (*Chelone viridis*). Presented by Messrs. Hill and Isaac, Lieuts. R.N.
1 Concave-casqued Hornbill (*Buceros bicornis*). Received in exchange.
1 Crowned Hornbill (*Buceros coronatus*). Received in exchange.
3 Yellow-billed Blue Magpies (*Urocissa flavirostris*). Received in exchange.
16. 2 Bonnet-Monkeys (*Macacus radiatus*), ♂ and ♀. Presented by Mrs. Harper.
1 White-throated Capuchin (*Cebus hypoleucus*). Purchased.
4 Derbian Opossums (*Didelphys derbiana*). Presented by Mr. L. R. Dickinson. From U. S. Columbia.
1 Wood-Owl (*Syrnium aluco*). Presented by Miss Pitcairn.
2 Variegated Sheldrakes (*Tadorna variegata*). Bred in the Gardens.
17. 1 Sooty Mangabey (*Cercocebus fuliginosus*), ♂. Deposited.
2 Impeyan Pheasants (*Lophophorus impeyanus*), ♂ and ♀. Purchased.
1 Mantchurian Crossoptilon (*Crossoptilon mantchuricum*). Purchased.
1 Malayan Bear (*Ursus malayanus*), ♂. Presented by Dr. F. Wicksteed.

May 17. 1 Undulated Grass-Parrakeet (*Melopsittacus undulatus*). Purchased.
1 Weeper Capuchin (*Cebus capucinus*). Presented by Mrs. Standish.
12 Sand-Lizards (*Lacerta agilis*). Presented by Mr. H. O. Forbes, F.Z.S.
4 Wall-Lizards (*Lacerta muralis*). Presented by Mr. H. O. Forbes, F.Z.S.
18. 2 Persian Gazelles (*Gazella subgutturosa*). Deposited.
1 Pinche Monkey (*Midas œdipus*). Received in exchange.
4 Black Francolins (*Francolinus vulgaris*). Received in exchange.
3 Pied Grass-Finches (*Spermestes fringilloides*). Received in exchange.
1 Crimson-winged Waxbill (*Pytelia phœnicoptera*). Received in exchange.
1 Half-white Finch (*Spermophila hypoleuca*). Received in exchange.
2 Yellow-throated Sparrows (*Passer luteus*). Received in exchange.
1 Shining Weaverbird (*Hypochera nitens*). Received in exchange.
1 Yellow-shouldered Weaverbird (*Euplectes capensis*). Received in exchange.
2 Red-headed Finches (*Amadina erythrocephala*), 2 ♀. Received in exchange.
20. 1 Humboldt's Saki (*Pithecia humboldti*), ♂. Purchased.
1 Manis (*Manis tricuspis*). Purchased. See P. Z. S. 1877, p. 530.
1 Red-and-yellow Macaw (*Ara chloroptera*). Purchased.
21. 1 African Buzzard (*Buteo desertorum*). Presented by Mr. A. Anderson, F.Z.S. See P. Z. S. 1877, p. 530.
22. 1 White-backed Pigeon (*Columba leuconota*). Deposited.
3 Carpet-Snakes (*Morelia variegata*). Presented by Mr. J. Moseley.
23. 1 Derbian Wallaby (*Halmaturus derbianus*), ♂. Born in the Menagerie.
1 Guianan Crested Eagle (*Morphnus guianensis*). Purchased. See P. Z. S. 1877, p. 531.
24. 1 Green-necked Peafowl (*Pavo spicifer*), ♀. Purchased.
1 Barred-tailed Pheasant (*Phasianus reevesi*), ♀. Purchased.
1 One-wattled Cassowary (*Casuarius uniappendiculatus*). Purchased. See P. Z. S. 1877, p. 531.
2 Bornean Firebacks (*Euplocamus nobilis*), ♂ and ♀. Purchased.
2 Swinhoe's Firebacks (*Euplocamus swinhoii*), ♂ and ♀. Purchased.
1 Barred-tailed Pheasant (*Phasianus reevesi*), ♀. Purchased.
2 Japanese Pheasants (*Phasianus versicolor*), ♂ and ♀. Purchased.
1 Fork-tailed Jungle-Fowl (*Gallus furcatus*), ♀. Purchased.
1 Great-headed Maleo (*Megacephalon maleo*). Purchased.
1 Daubenton's Curassow (*Crax daubentoni*). Deposited.
25. 1 American Moorhen (*Gallinula galeata*). Presented by Capt. Carl Hannes.
1 Carolina Rail (*Porzana carolina*). Presented by Capt. Carl Hannes.

May 25. 1 Common Quail (*Coturnix communis*), ♂. Presented by J. H. de Rinzy, Esq.
26. 2 Abyssinian Guinea-Fowls (*Numida ptilorhyncha*). Presented by Capt. Burke, S.S. 'Arcot.'
27. 1 Grey Ichneumon (*Herpestes griseus*), ♀. Presented by Dr. Lynn.
8 Green Tree-Frogs (*Hyla arborea*). Presented by Mr. S. A'Court.
1 Banded Ichneumon (*Herpestes fasciatus*). Presented by the Earl of Bective.
28. 1 Mesopotamian Fallow Deer (*Cervus mesopotamicus*), ♂. Purchased. See P. Z. S. 1877, p. 531.
2 Scarlet Ibises (*Ibis rubra*). Presented by Miss Attwood, F.Z.S.
29. 1 Humboldt's Lagothrix (*Lagothrix humboldti*). Received in exchange.
1 Swainson's Long-tailed Jay (*Calocitta formosa*). Purchased. From New Orleans.
1 African Leopard (*Felis pardus*), ♀. Purchased.
1 Woolly Cheetah (*Felis lanea*, sp. nov.) Purchased. See P. Z. S. 1877, p. 532, pl. LV.
1 Red-winged Parrakeet (*Aprosmictus erythropterus*). Presented by Mr. W. H. Moseley.
1 Prevost's Squirrel (*Sciurus prevosti*). Purchased.
2 Imperial Eagles (*Aquila imperialis*). Purchased.

June 1. 1 Rhesus Monkey (*Macacus erythræus*). Presented by Mr. H. Millet.
1 Reeves's Muntjac (*Cervulus reevesi*). Born in the Menagerie.
2. 1 White-cheeked Gibbon (*Hylobates leucogenys*), ♂. Presented by W. H. Newman, Esq., H.B.M. Consul at Bangkok. From the forests of Laos, Northern Siam. See P. Z. S. 1877, p. 679, pl. LXX.
1 Kinkajou (*Cercoleptes caudivolvulus*), ♂. Deposited.
1 Black-backed Jackal (*Canis mesomelas*), ♀. Presented by the Earl of Guilford.
3. 3 Variegated Sheldrakes (*Tadorna variegata*). Born in the Gardens.
4. 1 Lesser White-nosed Monkey (*Cercopithecus petaurista*). Presented by Mrs. Cleaver.
3 Crested Guinea-Fowls (*Numida cristata*). Deposited. From Mozambique.
2 Vulturine Guinea-Fowls (*Numida vulturina*). Deposited.
5. 1 Common Buzzard (*Buteo vulgaris*). Presented by Mr. F. Buckland.
4 Summer-Ducks (*Aix sponsa*). Bred in the Gardens.
6. 1 Imperial Eagle (*Aquila imperialis*). Deposited.
1 Smooth Snake (*Coronella lævis*). Presented by Lord Lilford.
12. A collection of Spotted Salamanders (*Salamandra maculosa*). Purchased.
13. 2 Condor Vultures (*Sarcorhamphus grypus*). Presented by Mr. John T. North.
1 Chilian Sea-Eagle (*Geranoætus aguia*). Presented by Mr. John T. North.
6 Chilian Pintails (*Dafila spinicauda*). Bred in the Gardens.
7 Spotted-billed Ducks (*Anas pœcilorhyncha*). Bred in the Gardens.
14. 2 Dorsal Squirrels (*Sciurus dorsalis*). Purchased.

June 14. 1 White-crowned Pigeon (*Columba leucocephala*). Purchased.
1 Orange-winged Dove (*Leptoptila ochroptera*). Purchased.
1 Sharp-nosed Crocodile (*Crocodilus americanus*). Purchased.
15. 1 Demeraran Cock of the Rock (*Rupicola crocea*). Purchased.
1 Green-winged Trumpeter (*Psophia viridis*). Purchased.
1 Common Trumpeter (*Psophia crepitans*). Purchased.
1 Sun-Bittern (*Eurypyga helias*). Purchased.
1 Banded-tailed Urubitinga (*Urubitinga zonura*). Purchased.
1 Black-necked Stilt-Plover (*Himantopus nigricollis*). Purchased.
2 Orinoco Geese (*Chenalopex jubata*). Purchased.
1 Capybara (*Hydrochœrus capybara*). Purchased.
1 Moor Monkey (*Semnopithecus maurus*), ♂. Purchased.
1 Meyer's Parrot (*Pœocephalus meyeri*). Purchased.
16. 2 Chaus Cats (*Felis chaus*). Presented by Mr. William Renney.
1 Tibetan Partridge (*Perdix hodgsoniæ*). Presented by Mr. M. J. M. Cornély, C.M.Z.S.
1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mr. M. J. M. Cornély, C.M.Z.S.
1 Natterjack Toad (*Bufo calamita*). Presented by Mr. H. W. Fielden.
17. 1 Crested Guan (*Penelope cristata*), ♂. Presented by Mr. Daniel Miron, of Vera Cruz.
19. 1 Purple Kaleege (*Euplocamus horsfieldi*), ♀ Presented by Mr. John Ditmas.
1 Pied Wagtail (*Motacilla yarrelli*). Purchased.
7 Spotted-billed Ducks (*Anas pœcilorhyncha*). Born in the Gardens.
20. 1 Hippopotamus (*Hippopotamus amphibius*), ♂. Purchased. Born in the Gardens of the Zoological Society of Amsterdam, July 3, 1876. See P. Z. S. 1877, p. 680.
1 Greater Sulphur-coloured Cockatoo (*Cacatua galerita*). Presented by Mr. W. L. Marchant.
2 Bronze-winged Pigeons (*Phaps chalcoptera*). Bred in the Gardens.
1 Geoffroy's Dove (*Peristera geoffroii*). Bred in the Gardens.
1 Greater Sulphur-coloured Cockatoo (*Cacatua galerita*). Deposited.
1 Barraband's Parrakeet (*Polytelis barrabandi*). Presented by Mr. W. H. Gregory.
21. 1 Patas Monkey (*Cercopithecus ruber*), ♀. Presented by Mr. Edward Poulson.
8 Summer-Ducks (*Aix sponsa*). Bred in the Gardens.
7 Chilian Pintails (*Dafila spinicauda*). Bred in the Gardens.
1 Common Kestrel (*Tinnunculus alaudarius*). Presented by Mr. A. Lidbury.
22. 1 Red-and-Blue Macaw (*Ara macao*). Deposited.
1 Lesser Black-backed Gull (*Larus fuscus*). Presented by Mr. J. Snell.
1 Imperial Eagle (*Aquila imperialis*). Deposited.
23. 1 Yellow Baboon (*Cynocephalus babouin*), ♂. Presented by Mr. H. E. Walters.
1 Rhesus Monkey (*Macacus erythræus*). Received in exchange.
1 Brown Coati (*Nasua nasica*). Deposited.
25. 2 Pig-tailed Monkeys (*Macacus nemestrinus*), ♂. Presented by Sir Harry St. George Ord, C.B., F.Z.S. From Johore, Malay peninsula.

June 25. 1 Black Leopard (*Felis pardus*). Presented by Sir Harry St. George Ord, C.B., F.Z.S. From Johore, Malay peninsula. See P. Z. S. 1877, p. 680.
1 Vieillot's Pheasant (*Euplocamus vieilloti*), ♀. Presented by Sir Harry St. George Ord, C.B., F.Z.S.
2 Argus Pheasants (*Argus giganteus*), ♂ and ♀. Presented by Sir Harry St. George Ord, C.B., F.Z.S.
1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mrs. Parkinson.
26. 1 Common Marmoset (*Hapale jacchus*). Purchased.
1 Black-eared Marmoset (*Hapale penicillata*). Purchased.
1 Hawk-headed Parrot (*Deroptyus accipitrinus*). Purchased.
1 Tibetan Partridge (*Perdix hodgsoniæ*). Purchased.
6 Chilian Pintails (*Dafila spinicauda*). Bred in the Gardens.
27. 1 North-American Reindeer (*Rangifer tarandus*), ♂. Presented by Capt. Edmund Fraser, 60th Royal Rifles. From Newfoundland.
1 Carrion-Crow (*Corvus corone*). Presented by Mr. W. M. Price.
1 Vulpine Phalanger (*Phalangista vulpina*). Born in the Menagerie.
28. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mr. G. McCheane.
10 Amherst Pheasants (*Thaumalea amherstiæ*). Bred in the Gardens.
2 Temminck's Tragopans (*Ceriornis temminckii*). Bred in the Gardens.
2 Forked-tailed Jungle-Fowls (*Gallus furcatus*). Bred in the Gardens.
29. 1 Javan Chevrotain (*Tragulus javanicus*), ♀. Presented by Mr. W. Trent.
1 African Cobra (*Naia haje*). Presented by Mr. Eustace Pillans.
30. 3 Black-bellied Sand-Grouse (*Pterocles arenarius*), 2 ♂ and 1 ♀. Presented by Col. J. S. Lowe.
1 Pale-headed Tree-Boa (*Epicrates angulifer*). Presented by Mr. A. L. Schütte. From Cuba.
20 Common Boas (*Boa constrictor*). Born in the Gardens. See P. Z. S. 1877, p. 680.

July 2. 1 Sun-Bittern (*Europyga helias*). Bred in the Gardens.
8 Speckled Terrapins (*Clemmys guttata*). Purchased.
3. 3 Red-vented Terrapins (*Clemmys rubriventris*). Purchased.
7 Muhlenburg's Terrapins (*Clemmys muhlenburgi*). Purchased.
2 American Box-Tortoises (*Terrapene carinata*). Purchased.
6. 1 Sacred Ibis (*Geronticus æthiopicus*). Bred in the Gardens.
4 Common Kingfishers (*Alcedo ispida*). Presented by Mr. J. Lyford.
2 Horned Lizards (*Phrynosoma cornutum*). Presented by Mr. W. A. Bowie.
9. 4 Axis Deer (*Cervus axis*). Deposited.
1 Leadbeater's Cockatoo (*Cacatua leadbeateri*). Presented by Mrs. Shand.
10. 1 Black-necked Swan (*Cygnus nigricollis*). Bred in the Gardens.
11. 1 ¾-breed Zebu (between *Bos indicus* ♂ and hybrid *Bos frontalis*), ♀. Born in the Menagerie.
1 Rhesus Monkey (*Macacus erythræus*). Presented by Mr. F. Rowling.

July 12. 1 Sambur Deer (*Cervus aristotelis*), ♂. Presented by H.R.H. the Prince of Wales, K.G.
1 Spotted Porcine Deer (*Cervus minor*), ♂. Presented by H.R.H. the Prince of Wales, K.G. See P. Z. S. 1876, p. 463.
2 Rampoor Hounds (*Canis familiaris*, var.). Presented by H.R.H. the Prince of Wales, K.G.
13. 1 Macaque Monkey (*Macacus cynomolgus*). Presented by Mr. E. Cochrane.
1 Merian's Opossum (*Didelphys dorsigera*). Purchased.
1 Slow Loris (*Nycticebus tardigradus*). Presented by Mr. W. H. Pattison.
1 Prehensile Paradoxure (*Paradoxurus prehensilis*). Presented by Mr. W. H. Pattison. See P. Z. S. 1877, p. 681, pl. LXXI.
14. 1 Red Howler (*Mycetes seniculus*), ♂. Deposited.
2 Striped Hyænas (*Hyæna striata*). Born in the Menagerie.
16. 1 Urumutum Curassow (*Nothocrax urumutum*). Purchased. From Brazil. See P. Z. S. 1877, p. 681.
2 Piping Guans (*Pipile cumanensis*). Purchased. From Bahia.
5 Rufous Tinamous (*Rhynchotus rufescens*). Purchased. From Buenos Ayres.
2 De Filippi's Meadow-Starlings (*Sturnella defilippii*). Purchased. From Buenos Ayres.
2 West-Indian Rails (*Aramides cayennensis*). Purchased.
2 White-faced Tree-Ducks (*Dendrocygna viduata*). Purchased.
1 Orinoco Goose (*Chenalopex jubata*). Purchased.
3 Cayenne Lapwings (*Vanellus cayennensis*). Purchased. From Buenos Ayres.
1 Burmeister's Cariama (*Chunga burmeisteri*). Purchased. From the Argentine Republic.
1 Chilian Sea-Eagle (*Geranoaëtus melanoleucus*). Purchased. From Uruguay.
1 Brown Milvago (*Milvago chimango*). Purchased.
1 Virginian Eagle-Owl (*Bubo virginianus*). Purchased. From Uruguay.
1 Brazilian Stilt-Plover (*Himantopus brasiliensis*). Purchased. From Buenos Ayres.
17. 1 Wapiti Deer (*Cervus canadensis*), ♀. Born in the Menagerie.
1 Slight-billed Cockatoo (*Licmetis tenuirostris*). Presented by Mrs. H. M. Richardson.
2 Silver Pheasants (*Euplocamus nycthemerus*), ♂ and ♀. Received in exchange.
18. 1 Egyptian Gazelle (*Gazella dorcas*), ♂. Presented by Mr. H. B. Benson.
2 Black Vultures (*Cathartes atratus*). Purchased.
1 Horned Tragopan (*Ceriornis satyra*), ♀. Received in exchange.
1 Malbrouck Monkey (*Cercopithecus cynosurus*). Presented by Mrs. Escott.
19. 2 Black Swans (*Cygnus atratus*). Deposited.
2 Black Vipers (*Vipera aspis*). Presented by Mr. G. F. Fenton. From France.
2 Common Snakes (*Tropidonotus natrix*). Presented by Mr. G. F. Fenton. From North Italy.
1 Smooth Snake (*Coronella lævis*). Presented by Mr. G. F. Fenton. From France.

July 20. 1 White-cheeked Capuchin (*Cebus lunatus*). Presented by the Hon. E. H. Ellis.
4 Silky Marmosets (*Midas rosalia*), 1 ♂ and 3 ♀. Presented by the Hon. E. H. Ellis.
1 Brown Coati (*Nasua nasica*). Presented by Mr. Thynne.
1 Indian Muntjac (*Cervulus muntjac*), ♀. Born in the Menagerie.
21. 3 Rhesus Monkeys (*Macacus erythræus*), 2 ♂ and 1 ♀. Presented by Mr. A. G. Williams.
1 White-headed Sea-Eagle (*Haliaëtus leucocephalus*). Presented by Mr. A. G. Williams.
3 Horned Vipers (*Vipera cornuta*). Deposited.
23. 1 Squirrel Monkey (*Saimaris sciurea*), ♀. Deposited.
5 Green Lizards (*Lacerta viridis*). Presented by Mr. A. Fraser.
1 Common Carp (*Carassius vulgaris*). Presented by Mr. A. Woods.
1 Military Macaw (*Ara militaris*). Purchased.
24. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mr. C. L. Norman.
25. 1 Common Crane (*Grus cinerea*). Chinese variety. Presented by Mr. T. Hance of Chingkiang. From Shantung, North China. See P. Z. S. 1877, p. 681.
1 Common Moorhen (*Gallinula chloropus*). Presented by Mr. J. Wildey.
26. 3 Chaplain Crows (*Corvus capellanus*). Presented by Dr. J. Huntly. From Fao, Persian Gulf.
27. 1 Barbary Ape (*Macacus inuus*). Deposited.
10 Amherst Pheasants (*Thaumalea amherstiæ*). Bred in the Gardens.
3 Temminck's Tragopans (*Ceriornis temminckii*). Bred in the Gardens.
1 Red River-Hog (*Potamochœrus penicillatus*), ♂. Received in exchange.
1 Common Hangnest (*Icterus vulgaris*). Presented by Miss Chambre.
28. 1 Raven (*Corvus corax*). Presented by Miss L. Latham Browne.
1 West-African Python (*Python sebæ*). Presented by Mr. Lionel Hart.
29. 1 Wapiti Deer (*Cervus canadensis*), ♂. Bred in the Gardens.
30. 1 Grivet Monkey (*Cercopithecus griseo-viridis*), ♂. Presented by Mr. J. Harvey.
1 Weeper Capuchin (*Cebus capucinus*), ♀. Presented by Mrs. Cameron.
31. 1 Wood-Brocket (*Cervus nemorivagus*), ♀. Presented by Mr. C. C. Berington. From Trinidad.
1 Oil-bird (*Steatornis caripensis*). From Trinidad. Presented by Mr. G. W. Des Vœux.
1 Berigora Hawk (*Hieracidea berigora*). Presented by Major Spicer, F.Z.S.
1 White Goshawk (*Astur novæ-hollandiæ*). Presented by Major Spicer, F.Z.S.
1 Great-billed Rhea (*Rhea macrorhyncha*). Received in exchange.

Aug. 2. 1 Axis Deer (*Cervus axis*), ♂. Born in the Menagerie.
1 Solitary Thrush (*Monticola cyanus*). Presented by Mr. W. W. Verner.

Aug. 2. 1 Harpy Eagle (*Thrasaëtus harpyia*). Received in exchange.
4. 6 Branched Seahorses (*Hippocampus ramulosus*). Purchased.
1 Levaillant's Amazon (*Chrysotis levaillanti*). Presented by Mr. H. King. From Vera Cruz, Mexico.
6. 2 Rufous Tinamous (*Rhynchotus rufescens*). Presented by Capt. Fairfax, R.N.
7. 1 Spotted Cavy (*Cœlogenys paca*). Presented by Mr. J. Trotter.
1 Coati (*Nasua nasica*), ♂. Presented by Mr. J. Trotter.
1 Gannet (*Sula bassana*). Presented by Mr. S. N. Sharpe.
8. 1 Central-American Agouti (*Dasyprocta isthmica*). Born in the Menagerie.
1 Geoffroy's Dove (*Peristera geoffroyi*). Hatched in the Gardens.
1 Roseate Cockatoo (*Cacatua roseicapilla*). Presented by Miss Potter.
9. 2 Common Swans (*Cygnus olor*). Presented by Major Kennan.
10. 1 Moustache-Monkey (*Cercopithecus cephus*), ♂. Presented by Lieut. E. F. Domville, R.N.
11. 1 Ring-necked Parrakeet (*Palæornis torquatus*). Presented by Mrs. Russell.
1 Common Chameleon (*Chamæleon vulgaris*). Presented by Mr. D. G. Wright.
4 Common Carps (*Cyprinus carpio*). Presented by Mr. Wood.
1 Common Tench (*Tinca vulgaris*). Presented by Mr. Wood.
13. 1 Slow Loris (*Nycticebus tardigradus*). Received in exchange.
3 Brazilian Tortoises (*Testudo tabulata*). Received in exchange.
1 Cape Hedgehog (*Erinaceus frontalis*). Received in exchange. See P. Z. S. 1877, p. 681.
14. 1 Guiana Partridge (*Odontophorus guianensis*). Purchased.
2 Solitary Tinamous (*Tinamus solitarius*). Purchased.
1 Obsolete Tinamou (*Crypturus obsoletus*). Purchased.
1 Fulvous Tree-Duck (*Dendrocygna fulva*). Purchased.
15. 1 Wedge-tailed Pigeon (*Treron sphenura*). Presented by Mrs. A. H. Jamrach.
1 Madagascar Boa (*Pelophilus madagascariensis*). Purchased.
16. 1 Spotted Turtle Dove (*Turtur suratensis*). Bred in the Gardens.
2 Martinique Waterhens (*Porphyrio martinicus*). Purchased.
5 Black Salamanders (*Salamandra atra*). Presented by Mr. Aug. Kussmaul. From Switzerland.
18. 1 Egyptian Gazelle (*Gazella dorcas*), ♀. Presented by Capt. John Graham. From Barbary.
1 Grey-headed Parrakeet (*Agapornis cana*). Presented by Mr. B. Barnett.
20. 1 Slender-billed Cockatoo (*Licmetis tenuirostris*). Presented by Major M. Pasley, R.A.
22. 1 Sœmmerring's Antelope (*Gazella sœmmerringi*), ♂. Presented by Capt. F. Cotton.
1 Arabian Gazelle (*Gazella arabica*), ♀. Presented by Capt. F. Cotton.
23. 1 Emu (*Dromæus novæ-hollandiæ*). Presented by Mr. F. Green.
1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mr. G. B. Southern.
24. 1 Crested Ground-Parrakeet (*Calopsitta novæ-hollandiæ*). Deposited.
26. 1 Purple-faced Monkey (*Semnopithecus leucoprymnus*), ♂ Purchased.
1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Miss Gover.

Aug. 27. 1 White-fronted Capuchin (*Cebus albifrons*). Presented by Mr. Shipman.
28. 1 Common Hangnest (*Icterus vulgaris*). Deposited.
1 Leadbeater's Cockatoo (*Cacatua leadbeateri*). Presented by the Rev. S. J. Whitmee, C.M.Z.S.
29. 1 Pig-tailed Monkey (*Macacus nemestrinus*). Presented by Mrs. Rintoul.
30. 1 Tamandua Anteater (*Tamandua tetradactyla*). Purchased.
1 American Darter (*Plotus anhinga*). Purchased.
1 Ashy-headed Gull (*Larus cirrhocephalus*). Purchased.
3 Brazilian Teals (*Querquedula brasiliensis*), 2 ♂ and 1 ♀. Purchased.
1 Brazilian Motmot (*Momotus brasiliensis*). Purchased. See P. Z. S. 1877, p. 681.
1 Sorry Thrush (*Turdus tristis*). Purchased.
1 American Tantalus (*Tantalus loculator*). Purchased. From the Rio Magdalena. See P. Z. S. 1877, p. 681.
2 Prince Albert's Curassow (*Crax alberti*), ♀. Purchased. From Cartagena.
3 Black-faced Spider-Monkeys (*Ateles ater*). Purchased. From Cartagena.
1 Kinkajou (*Cercoleptes caudivolvulus*). Purchased. From Belize.
1 Vinaceous Pigeon (*Columba vinacea*). Purchased. From Cartagena.
2 Wild Cats (*Felis catus*), ♂ and ♀. Received in exchange.
31. 1 Jameson's Gull (*Larus jamesoni*). Presented by Mr. C. Clifton, F.Z.S.
1 Barbary Ape (*Macacus inuus*). Presented by Mr. G. Nurse.
1 Barbary Ape (*Macacus inuus*). Deposited.
1 Æsculapian Snake (*Coluber æsculapii*). Presented by Mr. G. F. Fenton.
30 Wall-Lizards (*Lacerta muralis*). Presented by Mr. G. F. Fenton.
1 Green Lizard (*Lacerta viridis*). Presented by Mr. G. F. Fenton.

Sept. 5. 1 Vervet Monkey (*Cercopithecus lalandii*). Deposited.
1 Mandrill (*Cynocephalus mormon*). Presented by Mr. Francis Lovell.
1 Common Fox (*Canis vulpes*). Presented by Mr. R. Hayssen. From Germany.
6. 2 Mealy Amazons (*Chrysotis farinosa*). Deposited.
1 Ring-necked Parrakeet (*Palæornis torquata*). Deposited.
1 Common Paradoxure (*Paradoxurus typus*). Deposited.
7. 1 Egyptian Vulture (*Neophron percnopterus*). Deposited.
1 Short-toed Eagle (*Circaëtus gallicus*). Deposited.
1 Raven (*Corvus corax*). Deposited.
1 Common Genet (*Genetta vulgaris*). Deposited.
1 Great Ant-eater (*Myrmecophaga jubata*). Presented by the Hon. L. S. Sackville West. From Buenos Ayres.
2 Spotted-sided Finches (*Amadina lathami*). Presented by Mr. J. M. Mitchell.
1 Angola Vulture (*Gypohierax angolensis*). Presented by Mr. J. A. Solomon.
1 Vociferous Sea-Eagle (*Haliaëtus vocifer*). Presented by Mr. J. A. Solomon.

Sept. 7. 1 Aden Sheep (*Ovis aries*). Presented by Mr. A. Swanzy.
1 Common Kingfisher (*Alcedo ispida*). Presented by Mr. W. Thompson.
1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mrs. Cullen.
1 Crested Hangnest (*Ostinops cristatus*). Purchased.
1 Purple-faced Monkey (*Semnopithecus leucoprymnus*). Presented by Mr. J. H. B. Knocker.
10. 3 Capybaras (*Hydrochœrus capybara*). Purchased.
11. 1 West-African Python (*Python sebæ*). Presented by Mr. Francis Lovell.
1 Common Hangnest (*Icterus vulgaris*). Presented by Mr. Hamilton Dunlop.
14. 1 Violet Tanager (*Euphonia violacea*). Purchased.
1 Yellow-winged Blue Creeper (*Cœreba cyanea*). Purchased.
2 Talpacoti Ground-Doves (*Chamæpelia talpacoti*). Bred in the Gardens.
1 Porto-Rico Pigeon (*Columba corensis*). Bred in the Gardens.
15. 2 Guilding's Amazons (*Chrysotis guildingi*). Purchased. From St. Vincent, W. I. See P. Z. S. 1877, p. 683.
1 Osprey (*Pandion haliaëtus*). Presented by Mr. W. S. Quintin. From Yorkshire.
1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mr. A. S. Percival.
17. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Presented by Mr. W. W. Stead.
1 Capybara (*Hydrochœrus capybara*). Presented by Mr. W. Smith.
1 Goffin's Cockatoo (*Cacatua goffini*). Deposited.
1 Ariel Toucan (*Ramphastos ariel*). Purchased.
1 Maximilian's Aracari (*Pteroglossus wiedi*). Purchased.
2 Blue-bearded Jays (*Cyanocorax cyanopogon*). Purchased.
2 West-Indian Rails (*Aramides cayennensis*). Purchased.
18. 1 Grivet Monkey (*Cercopithecus griseo-viridis*), ♀. Presented by Mr. W. D. James.
1 Nisnas Monkey (*Cercopithecus pyrrhonotus*), ♀. Presented by Mr. W. D. James.
3 Andean Geese (*Bernicla melanoptera*). Purchased. From Peru.
2 Upland Geese (*Bernicla magellanica*). Purchased. From Patagonia.
2 Slaty Coots (*Fulica ardesiaca*). Purchased. From Peru. See P. Z. S. 1877, p. 683.
19. 1 West-African Python (*Python sebæ*). Presented by Mr. J. J. Kendall.
1 Royal Python (*Python regius*). Presented by Mr. J. J. Kendall.
20. 1 Axis Deer (*Cervus axis*), ♂. Born in the Menagerie.
21. 1 Rhesus Monkey (*Macacus erythræus*). Deposited.
22. 1 Peregrine Falcon (*Falco peregrinus*). Presented by the Rev. W. Willimott.
1 African Buzzard (*Buteo desertorum*). Presented by the Rev. W. Willimott.
23. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Mr. J. F. Greenwood.
1 Yellow-footed Rock-Kangaroo (*Petrogale xanthopus*). Born in the Menagerie.

Sept. 24. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mr. G. S. S. Williams.
1 Robben-Island Snake (*Coronella phocarum*). Presented by the Rev. G. H. R. Fisk, C.M.Z.S.
1 Java Sparrow (*Padda oryzivora*). Purchased.
26. 1 Chimpanzee (*Troglodytes niger*), ♂. Deposited.
2 Spotted Turtle Doves (*Turtur suratensis*). Bred in the Gardens.
27. 2 Red-backed Shrikes (*Lanius collurio*). Presented by Capt. F. H. Salvin.
2 Common Swans (*Cygnus olor*), ♂ and ♀. Deposited.
28. 1 Leonine Monkey (*Macacus leoninus*), ♂. Deposited.
1 Common Adder (*Vipera berus*). Presented by Mr. W. H. B. Pain.
29. 1 White-fronted Capuchin (*Cebus albifrons*), ♂. Purchased.
1 Laughing-Gull (*Larus atricilla*). Purchased.
3 Common Cormorants (*Phalacrocorax carbo*). Purchased.

Oct. 1. 1 Common Seal (*Phoca vitulina*.) Presented by Mr. G. Mellin.
2. 1 Vervet Monkey (*Cercopithecus lalandii*). Deposited.
1 Arabian Gazelle (*Gazella arabica*), ♀. Deposited.
3. 2 Peregrine Falcons (*Falco peregrinus*). Presented by Mr. Darill Stephens.
2 Emus (*Dromæus novæ-hollandiæ*). Presented by Lord Francis Conyngham, M.P., F.Z.S.
1 Lion (*Felis leo*), ♂. Deposited. From Persia.
5. 1 Grivet Monkey (*Cercopithecus griseo-viridis*), ♂. Presented by Mr. R. Dudgeon.
1 Great Kangaroo (*Macropus giganteus*), ♀. Presented by Mr. T. Phillips.
6. 1 Collared Peccary (*Dicotyles tajacu*). Presented by Mrs. E. J. Barrett.
1 Blackheaded Partridge (*Caccabis melanocephala*). Presented by Capt. Burke, S.S. 'Arcot.' From Hedjar.
1 Hyacinthine Porphyrio (*Porphyrio hyacinthinus*). Presented by Capt. Burke, S.S. 'Arcot.' From Mesopotamia.
1 Chinese Trionyx (*Trionyx perocellatus*). Purchased. From the Yang-tse Kiang river.
8. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Miss Ward.
1 Layard's Flying Squirrel (*Sciuropterus layardi*). Presented by Sir Charles Peter Layard. From Ceylon. See P. Z. S. 1877, p. 754.
9. 1 Wood-Owl (*Syrnium aluco*). Presented by Mrs. North.
10. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mr. T. Golding.
2 Red Kangaroos (*Macropus rufus*). Deposited.
11. 1 Vulpine Phalanger (*Phalangista vulpina*). Born in the Menagerie.
1 River Jack-Viper (*Vipera rhinoceros*). Presented by Mr. J. J. Kendall.
12. 1 Brown Coati (*Nasua nasica*). Presented by Dr. G. P. Best, M.R.C.S.
2 Bronze-winged Pigeons (*Phaps chalcoptera*). Bred in the Gardens.
4 Chinese Turtle Doves (*Turtur chinensis*). Deposited.
13. 1 White-whiskered Paradoxure (*Paradoxurus leucomystax*). Purchased.

Oct. 13. 1 Large-billed Crow (*Corvus culminatus*). Purchased.
15. 1 Azara's Fox (*Canis azaræ*). Purchased.
2 Crab-eating Raccoons (*Procyon cancrivorus*), ♂ and ♀. Purchased.
1 Yarrell's Curassow (*Crax carunculata*), ♂. Purchased. From Bahia.
1 Sclater's Curassow (*Crax sclateri*), ♀. Purchased. From the Amazons.
1 Globulose Curassow (*Crax globulosa*). ♀. Purchased. From the Amazons.
2 Brazilian Cariamas (*Cariama cristata*). Purchased.
1 Crested Screamer (*Chauna chavaria*). Purchased.
2 Solitary Tinamous (*Tinamus solitarius*). Purchased.
16. 4 Penguin Ducks (*Anas boschas*, var.). Presented by Mr. J. Guthrie, F.Z.S.
17. 4 Silky Cow-birds (*Molothrus bonariensis*). Purchased. From Bahia.
1 Yellow-winged Blue Creeper (*Cœreba cyanea*). Purchased. From Rio Janeiro.
1 Maximilian's Aracari (*Pteroglossus wiedi*). Purchased. From Rio Janeiro.
2 White-bellied Guans (*Ortalida albiventris*). Purchased. From Bahia.
1 Banded Cotinga (*Cotinga cincta*). Purchased. From Rio Janeiro.
1 Yellow-footed Thrush (*Turdus flavipes*). Purchased. From Rio Janeiro.
1 Garden's Night-Heron (*Nycticorax gardeni*). Purchased. From Brazil.
1 Black Tanager (*Tachyphonus melaleucus*), ♀. Purchased. From Bahia.
1 Macaque Monkey (*Macacus cynomolgus*), ♂. Deposited.
1 Smooth-headed Capuchin (*Cebus monochus*), ♀. Deposited.
18. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Mr. Watkins.
19. 1 Ostrich (*Struthio camelus*), ♀. Received in exchange.
1 Chub (*Leuciscus cephalus*). Presented by Mr. Parsons.
1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mr. Richard Turner.
22. 1 Common Genet (*Genetta vulgaris*). Presented by Mr. P. V. Carletti.
23. 2 Hyacinthine Porphyrios (*Porphyrio hyacinthinus*). Presented by Mrs. Henry Cobb.
24. 1 Diamond-Snake (*Morelia spilotes*). Purchased.
25. 3 Darwin's Pucras (*Pucrasia darwini*), 2 ♂ and 1 ♀. Deposited.
1 Pennant's Parrakeet (*Platycercus pennanti*). Presented by Mr. Henry Attwater.
1 Chinese Blue Magpie (*Urocissa sinensis*). Deposited.
1 Sun-Bittern (*Eurypyga helias*). Deposited.
1 Moose (*Alces machlis*), ♂. Purchased.
1 Gannet (*Sula bassana*). Presented by Mr. Alex. Paterson.
26. 2 All-green Parrakeets (*Brotogerys tiriacula*). Presented by Miss Rowe.
27. 2 Common Marmosets (*Hapale jacchus*). Presented by Mrs. Clayton.
2 East-African Buffalos (*Bubalus æquinoctialis*), ♂ and ♀. Purchased. See P. Z. S. 1877, p. 754.

Oct. 27. 1 Yellow-bellied Liothrix (*Liothrix luteus*). Presented by General Breton.
28. 3 Tigers (*Felis tigris*). Born in the Menagerie.
30. 1 Grey Ichneumon (*Herpestes griseus*), ♀. Presented by Mrs. Henry Jephson Mello.
1 Central-American Agouti (*Dasyprocta isthmica*). Presented by Mr. A. Stradling.
1 Puff-Adder (*Vipera arietans*). Presented by Mrs. Tweed.
31. 1 Cape-Buffalo (*Bubalus caffer*). Born in the Menagerie.
2 Geoffroy's Doves (*Peristera geoffroyii*). Bred in the Gardens.

Nov. 1. 1 Anubis Baboon (*Cynocephalus anubis*), ♂. Presented by Mr. H. Ward.
3 Sclater's Curassows (*Crax sclateri*), 1 ♂ and 2 ♀. Presented by Mr. Alex. F. Baillie. From Paraguay.
2 Coatis (*Nasua nasica*). Born in the Menagerie.
2. 1 Common Jackal (*Canis aureus*). Presented by Mr. John Allan.
1 Axis Deer (*Cervus axis*). Deposited.
1 Vulpine Phalanger (*Phalangista vulpina*). Presented by Mr. J. Page.
2 Cape-Doves (*Œna capensis*), ♂ and ♀. Presented by Mr. A. B. Wylde.
3. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Dr. W. B. Stirling.
1 Sooty Mangabey (*Cercocebus fuliginosus*), ♀. Presented by Mr. E. Sellars.
1 Brazilian Three-banded Armadillo (*Tolypeutes tricinctus*). Purchased. See P. Z. S. 1877, p. 805.
1 Pike (*Esox lucius*). Presented by Mr. A. D. Bartlett.
5. 5 Reindeer (*Rangifer tarandus*), 2 ♂ and 3 ♀. Deposited. From Lapland.
1 Californian Quail (*Callipepla californica*). Presented by Mrs. A. H. Jamrach.
2 Grey Plovers (*Squatarola helvetica*). Presented by Mr. F. Cresswell.
1 Ringed Plover (*Ægialites hiaticula*). Presented by Mr. F. Cresswell.
1 Dunlin (*Tringa cinclus*). Presented by Mr. F. Cresswell.
6. 1 Common Cuckoo (*Cuculus canorus*). Presented by Mr. J. Heath.
1 Ring-Hals Snake (*Sepedon hæmachates*). Presented by Mr. Eustace Pillans.
1 Cayenne Lapwing (*Vanellus cayennensis*). Purchased.
1 Brown Pelican (*Pelecanus fuscus*). Purchased. See P. Z. S. 1877, p. 805.
1 Cape-Zorilla (*Ictonyx zorilla*). Purchased.
7. 1 Saker Falcon (*Falco sacer*). Presented by Mrs. Arthur Coote. From Egypt.
8. 1 Cape-Buffalo (*Bubalus caffer*), ♂. Received in exchange.
9. 1 Wonga-Wonga Pigeon (*Leucosarcia picata*). Bred in the Gardens.
1 Tiger (*Felis tigris*). Presented by Mr. A. Forbes Angus. From China.
10. A collection of American Charr (*Salmo fontinalis*). Presented by Mr. F. Buckland.
11. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mr. H. W. Henderson.

Nov. 12. 1 Common Squirrel (*Sciurus vulgaris*). Presented by Mr. T. Massey, F.Z.S.
1 Radiated Tortoise (*Testudo radiata*). Presented by Mr. H. Harrison.
1 Bay Antelope (*Cephalophus dorsalis*), ♀. Received in exchange.
13. 2 Red-backed Squirrel Monkeys (*Saimaris œrstedi*), ♀. Purchased. From Chiriqui.
2 Black-handed Spider Monkeys (*Ateles melanochir*), ♀. Purchased.
1 Derbian Opossum (*Didelphys derbiana*). Purchased From Chiriqui.
1 Rufous-vented Guan (*Penelope cristata*). Purchased. From Greytown.
1 Bonnet-Monkey (*Macacus radiatus*). Deposited.
14. 1 Common Chameleon (*Chamæleon vulgaris*). Deposited.
1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mr. F. Lablache.
19. 1 Brown Tree-Kangaroo (*Dendrolagus inustus*). Purchased. See P. Z. S. 1877, p. 806.
1 Slow Loris (*Nycticebus tardigradus*). Purchased.
20. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Deposited.
21. 1 Common Boa (*Boa constrictor*). Presented by Miss Alice Leith.
1 River Jack-Viper (*Vipera rhinoceros*). Purchased.
22. 1 Black-backed Jackal (*Canis mesomelas*). Presented by Capt. Fulton, S.S. 'Taymouth Castle.'
24. 2 Black-eared Marmosets (*Hapale penicillata*). Presented by Miss Quain.
26. 1 Long-eared Owl (*Asio otus*). Presented by Mr. W. H. Millington.
3 Weeper Capuchins (*Cebus capucinus*). Purchased.
1 Squirrel Monkey (*Saimaris sciurea*). Purchased.
27. 1 Vervet Monkey (*Cercopithecus lalandii*). Presented by Mr. J. H. Taylor.
1 Little Grebe (*Podiceps minor*). Purchased.
28. 1 Sharp-nosed Crocodile (*Crocodilus americanus*). Received in exchange.
1 Spotted Ichneumon (*Herpestes auropunctatus*). Presented by Mrs. Fleuss. From Persia.
29. 1 Green Monkey (*Cercopithecus callitrichus*). Presented by Mr. J. R. Phillpotts.
2 Cheer Pheasants (*Phasianus wallichi*). Purchased.
30. 1 Red Wolf (*Canis jubatus*). Purchased. From Buenos Ayres. See P. Z. S. 1877, p. 806, pl. LXXXI.
1 Azara's Fox (*Canis azaræ*). Purchased.

Dec. 1. 1 Common Ocelot (*Felis pardalis*). Presented by Mr. George Ransom.
1 Scarlet Ibis (*Ibis rubra*). Presented by Mr. George Ransom.
1 Fulvous Tree-Duck (*Dendrocygna fulva*). Presented by Mr. George Ransom.
4. 1 Rhesus Monkey (*Macacus erythræus*), ♀. Presented by Mr. R. S. Cox.
2 Lesser Sulphur-coloured Cockatoos (*Cacatua sulphurea*). Presented by Mrs. Roberts.
5. 2 Schlegel's Doves (*Chalcopelia puella*), 2 ♂. Purchased.

Dec. 5. 4 Barbary Turtle Doves (*Turtur risorius*). Deposited.
1 Hobby (*Hypotriorchis subbuteo*). Presented by Mr. W. Renney. Captured at sea.
6. 2 White Storks (*Ciconia alba*). Presented by Mr. C. Clifton, F.Z.S.
1 Heron (*Ardea cinerea*). Presented by Mr. C. Clifton, F.Z.S.
1 Greater Black-backed Gull (*Larus marinus*). Presented by Mr. C. Clifton, F.Z.S.
7. 1 Diana Monkey (*Cercopithecus diana*), ♀. Presented by Mr. Walter Mayhew.
7 Gelada Baboons (*Cynocephalus gelada*), 3 ♂ and 4 ♀. Deposited. See P. Z. S. 1878, p. 1.
2 Alario Sparrows (*Passer alario*). Purchased.
10. 2 Axis Deer (*Cervus axis*), ♂ and ♀. Presented by Dr. Carl Siemens.
11. 2 Schlegel's Doves (*Chalcopelia puella*). Purchased.
12. 1 Chinchilla (*Chinchilla lanigera*). Born in the Menagerie.
2 Waxwings (*Ampelis garrulus*). Purchased.
4 Bullfinches (*Pyrrhula rubicilla*). Purchased.
4 Common Waxbills (*Estrelda cinerea*). Received in exchange.
2 African Silverbills (*Munia cantans*). Received in exchange.
2 Cinereous Waxbills (*Estrelda cærulescens*). Received in exchange.
7 Yellow-rumped Seed-eaters (*Crithagra chrysopyga*). Received in exchange.
6 Orange-cheeked Waxbills (*Estrelda melpoda*). Received in exchange.
13. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mr. T. H. Evans.
1 Diana Monkey (*Cercopithecus diana*). Presented by Mr. P. Spink. From the Akah country, W. Africa.
2 Lesser Razor-billed Curassows (*Mitua tomentosa*). Purchased.
1 Eel (*Anguilla vulgaris*). Presented by Mr. F. Buckland.
14. 1 Patas Monkey (*Cercopithecus ruber*), ♀. Deposited.
1 Red-backed Saki (*Pithecia chiropotes*). Purchased. From Trinidad.
1 Red-faced Spider Monkey (*Ateles paniscus*). Purchased.
2 Kinkajous (*Cercoleptes caudivolvulus*). Purchased.
1 Coati (*Nasua nasica*). Purchased.
1 Azara's Fox (*Canis azaræ*). Purchased.
1 Black Vulture (*Cathartes atratus*). Purchased.
15. 2 Alario Sparrows (*Passer alario*), 2 ♀. Purchased.
2 Musk Deer (*Moschus moschiferus*), ♂ and ♀. Presented by Sir Richard Pollock, K.C.S.I. See P. Z. S. 1878, p. 1.
17. 2 Grey-breasted Parrakeets (*Bolborhynchus monachus*). Presented by Mr. Alex. F. Baillie. From Paraguay.
21. 14 Mocassin Snakes (*Tropidonotus fasciatus*). Born in the Gardens.
22. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mrs. Cohen.
24. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Presented by Mr. J. Scott.
1 Bonnet-Monkey (*Macacus radiatus*), ♀. Presented by Mr. J. H. Thompson.
25. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Deposited.

Dec. 26. 2 Lions (*Felis leo*), 2 ♂. Presented by Mr. John Baird. From Upper Nubia.

27. 1 Common Thicknee (*Œdicnemus crepitans*). Presented by Mr. F. Moll.

28. 1 Collared Fruit-Bat (*Cynonyctoris collaris*). Born in the Menagerie.

1 Geoffroy's Dove (*Peristera geoffroyii*). Bred in the Gardens.

31. 1 Macaque Monkey (*Macacus cynomolgus*). Deposited.

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